

# POWER SUPPLIES

Switching • Linear



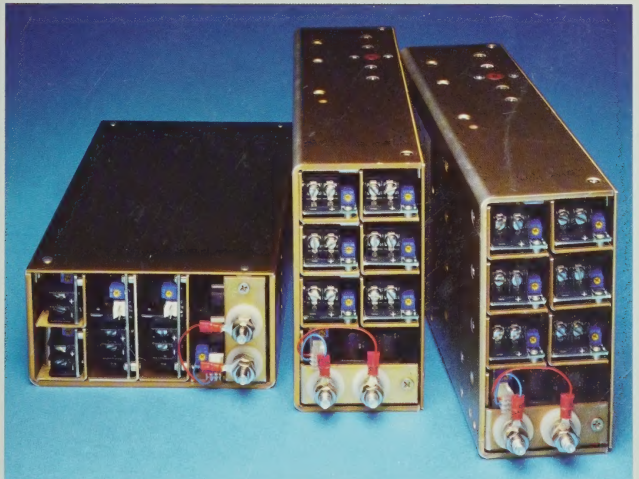
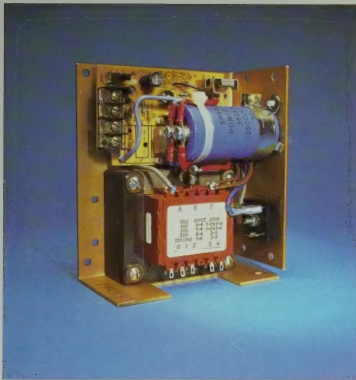
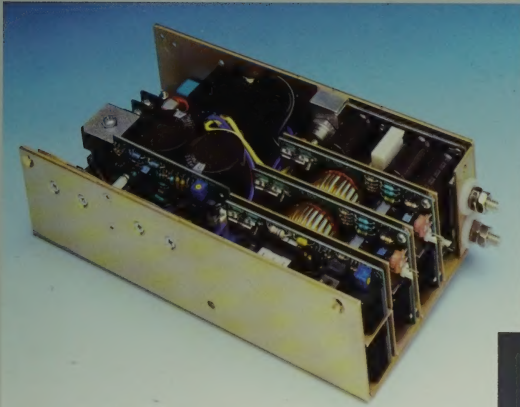
**Northeast**

John Griffith  
Sales Engineer

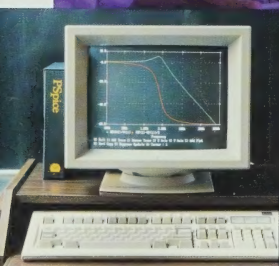


**Northeast**

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**Deltron inc.**



## FACILITIES

Deltron has World Class manufacturing facilities of approximately 100,000 square feet expandable by an additional 80,000 sq. ft. The facilities located in Reynosa, Mexico; North Wales, Pennsylvania and Dun Laoghaire, Ireland, produce a wide range of analog products including power supplies, control circuits, printed circuit assemblies and complex electro-mechanical products. In addition, Deltron manufactures components such as high-frequency and power frequency inductors and transformers, sheet metal items including chassis and cases.

## ENGINEERING AND DESIGN

In addition to standard products, Deltron also is expert at making custom designs to meet your specific needs compliant to various standards agencies such as UL, CSA, IEC, BSI, VDE and FCC. Our staff includes an innovative, competent team of analog engineers, most of them with advanced degrees.

The design function is implemented by high speed workstations for each engineer using the latest computer aided design software. In addition, the design team includes engineers particularly expert in circuit simulations.

Fully equipped laboratory facilities are available for design validation and test.

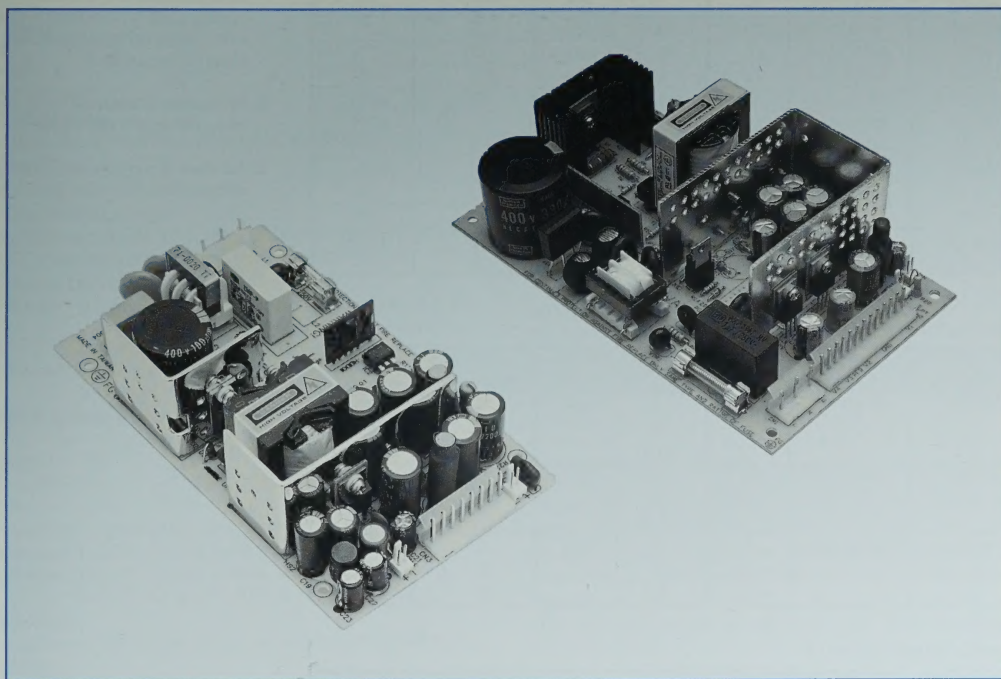
## QUALITY

Every Deltron employee has a total commitment to quality. ASQC 90-94 standards are used throughout each facility. All personnel are trained and certified by the Quality Department. Continued in-house training and awareness programs provide workers with the latest upgrades in technology.



# LOW WATTAGE SWITCHERS

24 Models • 1 – 4 Outputs • 40 – 130 Watts



## DESCRIPTION

### AP SERIES

AP Series 40-110 watt power supplies provide a reliable low cost solution for your system power. On board heat sinking allows convection ratings. All units have a universal input and comply with international safety and conducted noise standards.

### BP SERIES

BP Series 80 and 130 watt power supplies are fully compatible with industry standard equivalents. Units meet international safety and conducted noise standards and are ideally suited for all industrial and commercial applications.

## FEATURES

- UL, CSA, TUV safety.
- FCC/VDE Class B EMI compliance.
- 40 kilohertz MOSFET design.
- Current mode control.
- Flyback topology.
- Universal input.
- L Chassis mounting option.

- UL, CSA, TUV safety.
- FCC/VDE Class B EMI compliance.
- 150 kilohertz MOSFET design.
- Flyback/ Forward converter.
- Universal/ Autoranging input.
- Safety cover option.



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# MODELS & RATINGS

## AP SERIES – SINGLE OUTPUT

Power (W) (1) Conv/Air/Pk	Model	Volts	Amps			Total Reg
			Conv	F/Air	Peak (2)	
40/40/60	AP40-105	5	8	N/A	12	±2%
40/40/60	AP40-112	12	3.5	N/A	5.25	±2%
40/40/60	AP40-115	15	2.7	N/A	3.95	±2%
40/40/60	AP40-124	24	1.7	N/A	2.5	±2%
65/65/85	AP65-105	5	13	N/A	17	±2%
65/65/85	AP65-112	12	5.5	N/A	7	±2%
65/65/85	AP65-115	15	4.5	N/A	5.6	±2%
65/65/85	AP65-124	24	2.75	N/A	3.5	±2%
85/110/110	AP85-105	5	16.7	21.5	21.5	±2%
85/110/110	AP85-112	12	7	9.1	9.1	±2%
85/110/110	AP85-115	15	5.6	7.3	7.3	±2%
85/110/110	AP85-124	24	3.5	4.5	4.5	±2%

### NOTES:

1. Values shown are power ratings in convection free air, forced air and peak power capability. Individual output peak limits should not cause total peak power rating to be exceeded.
2. Peak power is available for 30 seconds max., with a 10% duty cycle.
3. Numbers in parentheses ( ) are peak ratings.

## AP SERIES – TRIPLE OUTPUT

Power (W) (1) Conv/Air/Pk	Model	Volts	Amps			Total Reg
			Conv	F/Air	Peak (2)	
40/40/60	AP40-312	+5	5	N/A	5	±3%
		+12	3		4.5	±5%
		-12	0.5		1	±8%
40/40/60	AP40-315	+5	5	N/A	5	±3%
		+15	2		2	±5%
		-15	0.3		1	±8%
40/40/60	AP40-324	+5	5	N/A	5	±3%
		+24	1		2	±10%
		-12	0.5		1	±5%

## AP SERIES – QUAD OUTPUT

Power (W) (1) Conv/Air/Pk	Model	Volts	Amps			Total Reg
			Conv	F/Air	Peak (2)	
65/65/90	AP65-412	+5	5.5	N/A	10	±3%
		+12	2.5		6	±5%
		-12	0.5		1	±10%
		-5	0.5		1	±10%
65/65/90	AP65-415	+5	6	N/A	10	±3%
		+15	3.5		4	±5%
		-15	1		N/A	±10%
		-5	1		N/A	±10%
85/110/125	AP85-412	+5.1	8	15	20	±3%
		+12	4.5	8	9	±5%
		-12	0.5	1	1.5	±5%
		-5	0.5	1	1.5	±3%
85/110/125	AP85-424	+5.1	8	15	20	±3%
		+12	4.5	8	9	±5%
		-12	0.5	1	1.5	±5%
		+24	3.5	4.5	4.5	+10/-5%
85/110/125	AP85-415	+5.1	8	15	20	±2%
		+15	4	5	7.5	±5%
		-15	0.5	1	1.5	±3%
		-5	0.5	1	1.5	±3%

## BP SERIES – QUAD OUTPUT

Power	Model	Output 1	Output 2 (3)	Output 3	Output 4	Total Reg
80	BP80-412	+5V/14A	+12V/4(6)A	-12V/1A	-5V/1A	±5%
80	BP80-424	+5V/14A	+24V/2A	+12V/1A	-12V/1A	±5%
130	BP130-412	+5V/20A	+12V/5(6)A	-12V/1.5A	-5V/1.5A	±5%
130	BP130-424	+5V/20A	+24V/2.5(3)A	+12V/1.5A	-12V/1.5A	±5%
Line Reg (typ)		±0.1%	±0.1%	±0.1%	±0.1%	
Load Reg (typ)		±1.0%	±1.0%	±1.0%	±1.0%	

## SPECIFICATIONS

### INPUT

90-264 VAC, 47-63 Hz for AP and BP80 models. BP130: 90-132 VAC or 180-264 VAC, 47-63 Hz. autoranging.

### INPUT SURGE

	115 VAC	230 VAC
AP Series	20A	40A
BP80	23A	45A
BP130	15A	30A

from cold start.

### HOLDUP TIME

20 milliseconds from loss of nominal AC power.

### OUTPUTS

See model selection table.

### TOTAL REGULATION

Includes line changes of  $\pm 15\%$ , load changes from 25 to 100%, cross regulation effects and setting tolerance.

### MINIMUM LOAD

**AP Series:** 0.2 Amps required on singles and outputs 1 and 2 of multiple output units. The power supply will not be damaged at no load operation.

**BP Series:** 1.4 Amps for BP80 and 3 Amps for BP130 on output 1.

### RIPPLE & NOISE

Series	5V	12V	24V	
AP	1%	1%	1%	pk.-pk.
BP	2.4%	1.6%	1%	

### OPERATING TEMPERATURE

**AP Series:** 0-50°C. Derate 2.5%/°C to 70°C.

**BP Series:** 0-50°C. Derate to 40% at 60°C (convection). 0-60°C. Derate to 40% at 70°C (forced air).

### COOLING

Convection ratings apply where non-restricted air flow is available.

Forced air ratings require a minimum of 30 CFM. Heatsink temperatures not to exceed 100°C.

### TEMPERATURE COEFFICIENT

$\pm 0.03\%/^{\circ}\text{C}$  typical.

### EFFICIENCY

70% typical.

### SAFETY

Units meet UL 1950, CSA 22.2 No. 234 or 1402C Level 3, EN 60 950, IEC 950.

### DIELECTRIC WITHSTAND

3000 VRMS input to output.

### EMISSIONS

Units meet FCC 20780 and VDE 0871 Class B.

### OVERVOLTAGE PROTECTION

All 5 V outputs have built-in fixed crowbar.

### OVERLOAD PROTECTION

**AP Series:** Power limited to 150% maximum of total power.

**BP Series:** Outputs short circuit protected by current foldback with automatic recovery.

### MECHANICAL

Series	H	W	L
AP40-1XX	1.10"	3.00"	5.00"
AP40-3XX	1.30"	3.00"	5.00"
AP65-1XX	1.46"	3.50"	6.00"
AP65-412	1.67"	3.50"	6.00"
AP65-415	1.45"	3.50"	6.00"
AP85-XXX	1.88"	4.29"	7.00"
BP80-4XX	1.80"	4.20"	7.20"
BP130-4XX	2.00"	4.50"	8.50"

### L CHASSIS

Optional L shaped chassis for additional mounting convenience. Specify suffix L. See drawing. AP Series only.

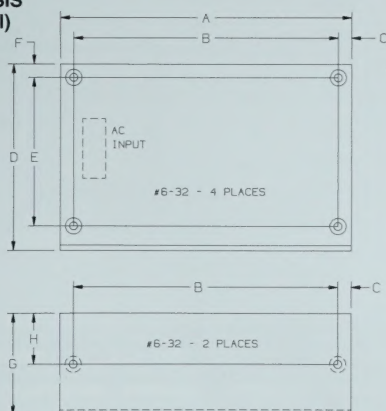
### COVER

Optional screen cover for safety and EMI. Specify suffix C. BP Series only.

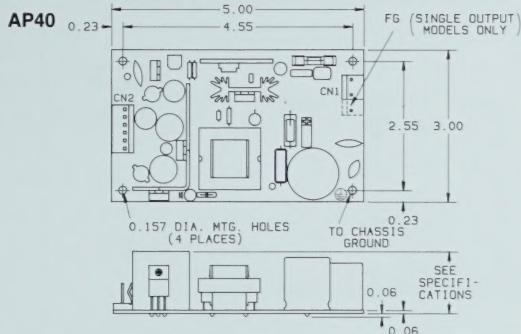
Specifications subject to change without notice.

## DIMENSIONS

### L CHASSIS (Optional)



	AP40	AP65	AP85
A	5.00	6.00	7.00
B	4.55	4.80	6.50
C	.23	.60	.26
D	3.20	3.80	4.50
E	2.55	3.15	3.75
F	.23	.20	.25
G	1.75	2.10	2.25
H	.90	1.10	1.15



CONNECTOR	CN1	CN2
FUNCTION	INPUT	OUTPUT
MODEL	AP40-XXX	AP40-1XX AP40-3XX
PIN 1	L	V1 V2
PIN 2	N/C	V1 V1
PIN 3	N	V1 V1
PIN 4	N/C	RTN RTN
PIN 5	G	RTN RTN
PIN 6		RTN V3
MOLEX (or equiv.)	09-65-2058	09-65-2068
MATING	09-50-1051	09-50-1061

AP40-3XX models have two pin CN1 connections only.

Mate with MOLEX 09-50-1031, or equivalent.

For all connections Pin 1 is defined as far right pin when facing open side of connector.



**STANDARD PRODUCTS**

		Series	Page
120-600 Watts .....	1-4 Output Switchers .....	V .....	4
	■ Competitive Price		
	■ Open and Closed Frame		
360-600 Watts .....	1-5 Output Switchers .....	CV .....	8
	■ Low Profile Enclosed Modules		
	■ Fan Cooled		
200-1500 Watts .....	1-7 Output Switchers .....	M, DM, VM, VX .....	12
	■ AC & DC Inputs		
	■ Up to 10W/in <sup>3</sup>		
	■ Outputs Isolated and Regulated		
600-2000 Watts .....	1-4 Output 0.99 PFC Switchers .....	FM .....	16
	■ 0.99 Power Factor		
	■ Harmonics Meet IEC 555-2		
1300-2600 Watts .....	PFC Module .....	PFC .....	20
	■ Stand alone Power Factor Corrector		
	■ 0.99 PF. Meets IEC 555-2		
15-300 Watts .....	1-3 Output Linears .....	W, R .....	22
	■ Low Cost Open Frames		
	■ High Density Packages		

**CUSTOM PRODUCTS**

200-750 Watts .....	1-7 Output Switchers .....	M, DM .....	26
	■ AC & DC Inputs		
	■ Up to 6W/in <sup>3</sup>		
	■ Outputs Isolated and Regulated		
600-2000 Watts .....	1-7 Output 0.99 PFC Switchers .....	FM .....	30
	■ 0.99 Power Factor		
	■ Harmonics Meet IEC 555-2		
500-1800 Watts .....	1-5 Output Switchers .....	VF, DVF .....	34
	■ Outputs Isolated and Regulated		
	■ Enclosed Box Modules		
	■ AC & DC Inputs		

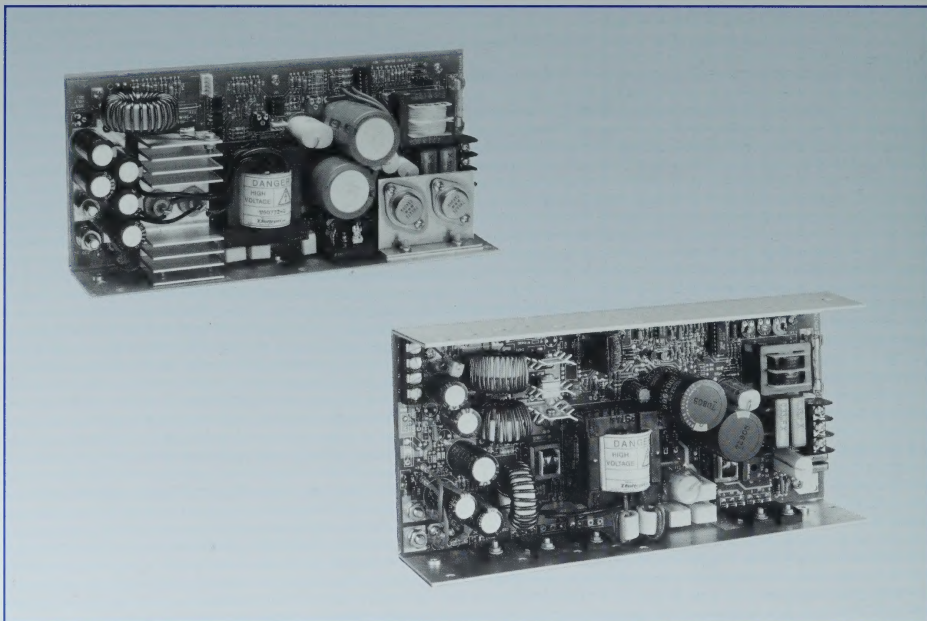
**GENERAL INFORMATION**

■ Ordering Information	38
■ Technical Support	

**Call Toll Free 800-523-2332  
to talk to an application engineer.**

# OPEN FRAME SWITCHERS

## 68 Models • Direct From Factory Stock



### DESCRIPTION

V Series World Class switching power supplies are a family of single and quad output models designed for a wide variety of commercial and industrial applications. These industrial workhorses have demonstrated MTBF ratings greater than 200,000 hours. A proprietary proportional drive circuit prevents excess switch saturation and permits higher switching frequency operation. This makes possible increased reliability and a compact size.

One of the unique features of the V Series is a dual loop regulation system that eliminates cross regulation between the main output and all auxiliary outputs. This system provides a tightly regulated main output and also regulates the auxiliary outputs so post regulators are normally not required.

When you choose the V Series you receive reliable products with superior performance at competitive prices.

### FEATURES

- UL, CSA, TUV (IEC, VDE) certified\*. CB Test Certification in process.
- 4 watts per cubic inch.
- 1-4 outputs, 120-600 watts.
- 80% typical efficiency.
- 200,000 hrs. demonstrated MTBF.
- Quad mode soft start.
- Dual line spike suppression.
- Proportional drive.
- Dual loop regulation system.
- High power auxiliaries.
- High peak current capability.
- Options include:
  - Power fail monitor*
  - Thermal shutdown*
  - Cover*
  - Logic inhibit*
  - Auto Ranger*
  - Post Regulator*

\*Most models

## MODELS & RATINGS—General purpose single and multiple outputs

V SINGLES	Output	Max Power
Model		
V120AXX	5V/25A	120W
V120BXX	12V/10A	
V120CXX	15V/8A	
V120DXX	24V/5A	
V180AXX	5V/36A	180W
V180BXX	12V/15A	
V180CXX	15V/12A	
V180DXX	24V/7.5A	
V250AXX	5V/50A	250W
V250BXX	12V/21A	
V250CXX	15V/17A	
V250DXX	24V/11A	
V270AXX	5V/54A	270W
V270BXX	12V/22A	
V270CXX	15V/18A	
V270DXX	24V/12A	

Model	Output	Max Power
V360AXX	5V/72A	360W
V360BXX	12V/30A	
V360CXX	15V/24A	
V360DXX	24V/15A	
V501AXX	5V/100A	500W
V501BXX	12V/42A	
V501CXX	15V/33A	
V501DXX	24V/21A	
V601AXX	5V/120A	600W
V601BXX	12V/50A	
V601CXX	15V/40A	
V601DXX	24V/25A	

Other voltages, e.g. 2V, 3.3V, 28V, and 48V available on special order.

V QUADS	Output 1	Output 2	Output 3	Output 4	Max Power
Model					
V300AXX	5V/40A	+ 12V/4A	– 12V/4A	– 5V/3A	300W
V300BXX	5V/40A	+ 12V/4A	– 12V/4A	+ 24V/3(5)A	
V300CXX	5V/40A	+ 15V/4A	– 15V/4A	– 5V/3A	
V300DXX	5V/40A	+ 15V/4A	– 15V/4A	+ 24V/3(5)A	
V300EXX	5V/40A	+ 12V/4A	– 12V/4A	+ 12V/3(5)A	400W
V400AXX	5V/50A	+ 12V/8A	– 12V/8A	– 5V/4A	
V400BXX	5V/50A	+ 12V/8A	– 12V/8A	+ 24V/4(6)A	
V400CXX	5V/50A	+ 15V/8A	– 15V/8A	– 5V/4A	
V400DXX	5V/50A	+ 15V/8A	– 15V/8A	+ 24V/4(6)A	500W
V400EXX	5V/50A	+ 12V/8A	– 12V/8A	+ 12V/4(6)A	
V500AXX	5V/60A	+ 12V/10A	– 12V/10A	– 5V/5A	
V500BXX	5V/60A	+ 12V/10A	– 12V/10A	+ 24V/5(8)A	
V500CXX	5V/60A	+ 15V/10A	– 15V/10A	– 5V/5A	600W
V500DXX	5V/60A	+ 15V/10A	– 15V/10A	+ 24V/5(8)A	
V500EXX	5V/60A	+ 12V/10A	– 12V/10A	+ 12V/5(8)A	
V600AXX	5V/80A	+ 12V/10(20)A	– 12V/10A	– 5V/5A	
V600BXX	5V/80A	+ 12V/10A	– 12V/10A	+ 24V/5(10)A	225W
V600CXX	5V/80A	+ 15V/10(20)A	– 15V/10A	– 5V/5A	
V600DXX	5V/80A	+ 15V/10A	– 15V/10A	+ 24V/5(10)A	
V600EXX	5V/80A	+ 12V/10(20)A	– 12V/10A	+ 12V/5A	
V225AXX	5V/30A	+ 12V/6(12)A	– 12V/4A	– 5V/4A	325W
V225BXX	5V/30A	+ 12V/6A	– 12V/4A	+ 24V/4(8)A	
V225CXX	5V/30A	+ 15V/6(12)A	– 15V/4A	– 5V/4A	
V225DXX	5V/30A	+ 15V/6A	– 15V/4A	+ 24V/4(8)A	
V225EXX	5V/30A	+ 12V/6(12)A	– 12V/4A	+ 12V/4A	200W
V325AXX	5V/45A	+ 12V/8(16)A	– 12V/6A	– 5V/4A	
V325BXX	5V/45A	+ 12V/8A	– 12V/6A	+ 24V/4(8)A	
V325CXX	5V/45A	+ 15V/8(16)A	– 15V/6A	– 5V/4A	
V325DXX	5V/45A	+ 15V/8A	– 15V/6A	+ 24V/4(8)A	300W
V325EXX	5V/45A	+ 12V/8(16)A	– 12V/6A	+ 12V/4A	
VP200AXX	5V/30A	+ 12V/5A	– 12V/1.5A	– 5V/1.5A	
VP200BXX	5V/30A	+ 12V/5A	– 12V/1.5A	+ 24V/1.5A	
VP200CXX	5V/30A	+ 15V/5A	– 15V/1.5A	– 5V/1.5A	300W
VP200DXX	5V/30A	+ 15V/5A	– 15V/1.5A	+ 24V/1.5A	
VP200EXX	5V/30A	+ 12V/5A	– 12V/1.5A	+ 12V/1.5A	
VP300AXX	5V/45A	+ 12V/7.5A	– 12V/3A	– 5V/3A	
VP300BXX	5V/45A	+ 12V/7.5A	– 12V/3A	+ 24V/3A	300W
VP300CXX	5V/45A	+ 15V/7.5A	– 15V/3A	– 5V/3A	
VP300DXX	5V/45A	+ 15V/7.5A	– 15V/3A	+ 24V/3A	
VP300EXX	5V/45A	+ 12V/7.5A	– 12V/3A	+ 12V/3A	

### NOTES

1. VP models have post regulators on all auxiliaries. Specifications are guaranteed to no load on auxiliaries.
2. Numbers in parentheses ( ) are peak ratings for short duration service such as motor starting.
3. Output 1 is floating and can be either polarity.
4. Quads require 10% of maximum power distributed among auxiliary outputs for optimum performance.
5. Outputs can operate to no load with slight increase in specifications.
6. For agency certifications units must be purchased with 04 option.

## SPECIFICATIONS

**OUTPUTS**

See table of models.

**INPUT**

90-132 VAC or 180-264 VAC, 47-440 Hz.

Consult factory for 400 Hz. operation.

**INPUT SURGE**

17A peak from cold start for models up to 250 watts or less, 68A for other models, from nominal 110 or 220 VAC.

**LINE REGULATION**

±0.1% for line change from nominal to min. or max. rating with 20% min. load on the measured output.

±0.05% with post regulator and no min. load. Singles to no load.

**LOAD REGULATION**

5V main/singles ±0.2%

-5V aux. ±3%

±12V aux. ±2%

±15V aux. ±2%

+24V aux. ±1.5%

**Post Regulated Outputs**

VP models - ±0.5%

Option 32 - ±0.05%

for load change from 60% to 20% or 100% max. rating. With post regulator to no load. Singles to no load.

**CROSS REGULATION**

±0.2% for load change on the main 5V output from 75% to 50% or 100% max. rating with 20% min. load on the measured output.

±0.05% with post regulator and no min. load. Not applicable to singles.

**CENTERING**

5V main/singles ±5% trim adj.

1st and 2nd aux. ±5% trim adj. tracking

3rd aux.: -5V ±3%

+12V ±2%

+24V ±1%

with all outputs loaded to 50% max. ratings and output #2 set precisely at its rated value. With post regulator-±3% trim adj.

**RIPPLE & NOISE**

1% or 100 mV, pk.-pk., 20 MHz. bandwidth.

**REMOTE SENSING**

On 5V main/singles which are fully isolated from all auxiliaries.

**HOLDUP TIME**

20 milliseconds after loss of nominal AC power.

**EFFICIENCY**

80% typ.

**OVERVOLTAGE PROTECTION**

Standard on main output/singles. Optional on auxiliaries.

**OPERATING TEMPERATURE**

0-50°C under the tabulated conditions.

Derate 2.5%/°C above 50°C to 70°C.

Models	Forced Air
V225, VP200, V250, V270, V360	30 CFM
V600, V601, V325, VP300, V300, V400, V500, V501	60 CFM

**TEMPERATURE COEFFICIENT**

5V main/singles ±0.02%/°C

Auxiliaries ±0.05%/°C

With post regulator ±0.02%/°C

**OVERLOAD**

Outputs short circuit protected by current foldback with automatic recovery. Post regulators have individual current foldback protection.

**REVERSE VOLTAGE PROTECTION**

All outputs are protected up to load ratings.

**SAFETY**

Units meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805.

**LEAKAGE CURRENT**

0.75 mA at 115 VAC, 60 Hz. input.

**SPACING**

8 mm primary to secondary.

4 mm primary to grounded circuits.

**DIELECTRIC WITHSTAND**

3750 VRMS input to ground.

3750 VRMS input to output.

700 VDC output to ground.

**EMISSIONS**

Units meet FCC 20780 Part 15 Class A and VDE 0871/6.78 Class A for conducted emissions. Compliance with Class B limits by use of additional external filter.

**AC UNDERVOLTAGE**

Proprietary proportional drive and low voltage lockout protects against damage for undervoltage operation.

**SOFT START**

Units have soft start feature to protect critical components.

**DYNAMIC RESPONSE**

Peak transient less than ±2% or ±200 mV for step load change from 75% to 50% or 100% max. ratings.

**RECOVERY TIME**

Less than 400 microseconds on main/singles output.

Less than 50 microseconds on post regulated auxiliaries.

**INHIBIT**

Optional TTL logic inhibit input.

**THERMAL SHUTDOWN**

Optional circuit cuts off supply in case of local over temperature.

Unit resets automatically if excess temperature abates.

**POWER FAIL MONITOR**

Optional monitor provides a TTL signal 2 ms. min. prior to loss of output power with outputs fully loaded from 100VAC/200VAC line loss.

**SHOCK**

MIL-STD 810-D Method 516.3, Procedure III.

**VIBRATION**

MIL-STD 810-D Method 514.3, Category 1, Procedure I.

**COVER**

Optional cover for safety and EMI.

**POST REGULATOR**

Optional for output #4 on V300, V400, V500, V600 models. VP models have post regulators on all auxiliaries.

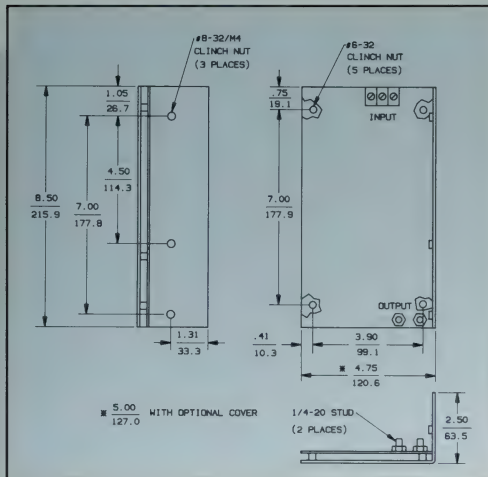
**AUTO RANGER**

Model AR-1 accessory provides automatic operation at specified input ranges without strapping.

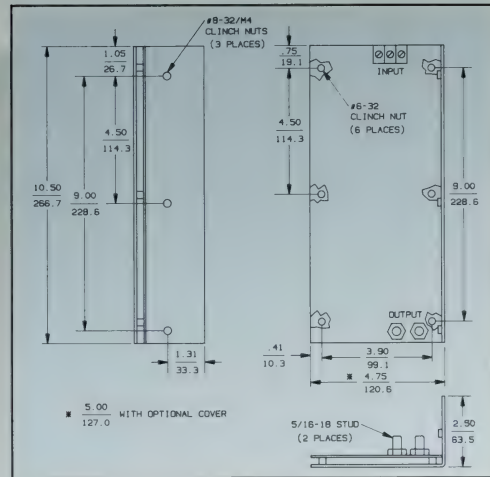
**OPTIONS**—To order, replace XX in model numbers with sum of Option Codes desired.

Option Code	Function
00	None
01	OVP protects all auxiliaries. Not for singles.
02	Power Fail Monitor
04	Thermal Shutdown
08	Cover. Fan placed for comparable flow as in uncovered units.
16	Logic Inhibit
32	Post Regulator, -5V@4A, +12V@3A, or +24V@2A. Not for singles, V225 or V325.

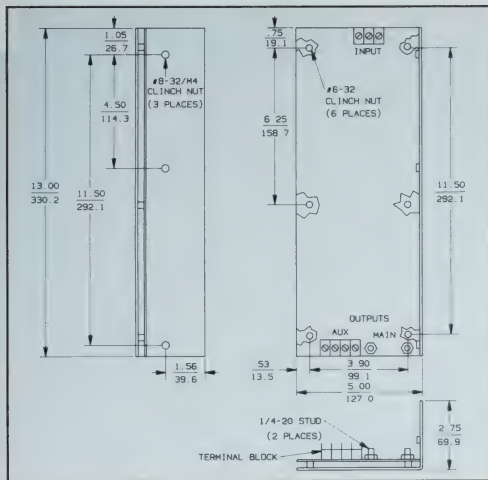
**SERIES V120, V180, V250**



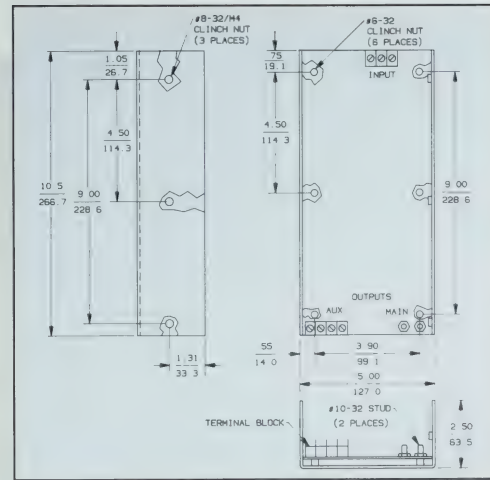
**SERIES V270, V360, V501, V601**



**SERIES V300, V400, V500, V600**



**SERIES V225, V325, VP200, VP300**



# ENCLOSED LOW PROFILE SWITCHERS



## DESCRIPTION

The CV Series is a line of low profile, fan cooled power supplies which utilize Deltron's field proven V Series sub-assemblies. The series provides 1 to 5 outputs in a rugged enclosed package slightly higher than 3 inches and 5 inches in width. With power ratings of 360 to 600 watts, these units are a space saving alternative to the 5 x 8 inch box module.

A key feature of the CV Series is the unique dual loop regulation system. This system eliminates cross regulation between the main output and all auxiliary outputs. Also, the high demonstrated MTBF makes these units an excellent choice for many system applications.

## FEATURES

- UL, CSA, TUV (IEC, VDE) design.
- 4 watts per cubic inch.
- 1-5 outputs, 360-600 watts.
- 80% typical efficiency.
- 200,000 hrs. demonstrated MTBF.
- Dual loop regulation system.
- High power auxiliaries.
- High peak current capability.
- Heavy duty enclosed chassis.
- Options include:
  - Power fail monitor*
  - Thermal shutdown*
  - Logic inhibit*
  - Auto Ranger*

## MODELS & RATINGS —General purpose single and multiple outputs

MODEL	POWER	MAIN OUTPUT		AUX. #1 OUTPUT		AUX. #2 OUTPUT		AUX. #3 OUTPUT		AUX. #4 OUTPUT		CASE SIZE
	Watts	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	
CV360AXX	360	5	72									A
CV360BXX	360	12	30									A
CV360CXX	360	15	24									A
CV360DXX	360	24	15									A
CV360JXX	360	28	13									A
CV360EXX	360	48	7.5									A
CV501AXX	500	5	100									A
CV501BXX	500	12	42									A
CV501CXX	500	15	33									A
CV501DXX	500	24	21									A
CV501JXX	500	28	18									A
CV501EXX	500	48	10.5									A
CV601AXX	600	5	120									A
CV601BXX	600	12	50									A
CV601CXX	600	15	40									A
CV601DXX	600	24	25									A
CV601JXX	600	28	21.5									A
CV601EXX	600	48	12.5									A
CV400AXX	400	5	50	+12	8	-12	8	-5	4			B
CV400BXX	400	5	50	+12	8	-12	8	+24	4 (6)			B
CV400CXX	400	5	50	+15	8	-15	8	-5	4			B
CV400DXX	400	5	50	+15	8	-15	8	+24	4 (6)			B
CV400EXX	400	5	50	+12	8	-12	8	+12	4 (6)			B
CV500AXX	500	5	60	+12	10	-12	10	-5	5			B
CV500BXX	500	5	60	+12	10	-12	10	+24	5 (8)			B
CV500CXX	500	5	60	+15	10	-15	10	-5	5			B
CV500DXX	500	5	60	+15	10	-15	10	+24	5 (8)			B
CV500EXX	500	5	60	+12	10	-12	10	+12	5 (8)			B
CV600AXX	600	5	80	+12	10 (20)	-12	10	-5	5			B
CV600BXX	600	5	80	+12	10	-12	10	+24	5 (10)			B
CV600CXX	600	5	80	+15	10 (20)	-15	10	-5	5			B
CV600DXX	600	5	80	+15	10	-15	10	+24	5 (10)			B
CV600EXX	600	5	80	+12	10 (20)	-12	10	+12	5 (8)			B
CV405BXX	400	5	50	+12	8	-12	8	+24	4 (6)	5	10	B
CV405DXX	400	5	50	+15	8	-15	8	+24	4 (6)	5	10	B
CV405EXX	400	5	50	+12	8	-12	8	+12	4 (6)	5	10	B
CV505BXX	500	5	60	+12	10	-12	10	+24	5 (8)	5	12	B
CV505DXX	500	5	60	+15	10	-15	10	+24	5 (8)	5	12	B
CV505EXX	500	5	60	+12	10	-12	10	+12	5 (8)	5	12	B
CV605BXX	600	5	80	+12	10	-12	10	+24	5 (10)	5	15	B
CV605DXX	600	5	80	+15	10	-15	10	+24	5 (10)	5	15	B
CV605EXX	600	5	80	+12	10	-12	10	+12	5 (8)	5	15	B

Other voltages, e.g. 2V, 3.3V, 28V, and 48V available on special order.

## OPTIONS

To order, replace XX in model numbers with sum of Option Codes desired.

Option Code	Function
00	None
01	OVP protects all auxiliaries. Not for singles
02	Power fail monitor
04	Thermal shutdown
08	Logic inhibit
16	Auto Ranger

### NOTES:

1. Ratings in parentheses ( ) are peak values for short duration service such as motor starting.
2. For optimum performance, multiple output units require 10% of max. power distributed among all auxiliaries.
3. All outputs can operate to no load with slight increase in specification limits.

## SPECIFICATIONS

### OUTPUTS

See table of models.

### INPUT

90-132 VAC or 180-264 VAC, 47-63 Hz.

### INPUT SURGE

Less than 68 Amps peak from cold start.

### LINE REGULATION

±0.1% for line change from nominal to min. or max. rating with 20% min. load on the measured output.  
Singles to no load.

### LOAD REGULATION

5V main/4th aux./singles	±0.2%
-5V aux.	±3%
±12V aux.	±2%
±15V aux.	±2%
+24V aux.	±1.5%

for load change from 60% to 20% or 100% max. rating.  
Singles to no load.

### CROSS REGULATION

±0.2% for load change on the main 5V output from 75% to 50% or 100% max. rating with 20% min. load on the measured output. Not applicable to singles.

### CENTERING

5V main/4th aux./singles	±5% trim adj.
1st and 2nd aux.	±5% trim adj. tracking
3rd aux.: -5V	±3%
+12V	±2%
+24V	±1%

with all outputs loaded to 50% max. ratings and output #2 set precisely at its rated value.

### RIPPLE & NOISE

1% or 100 mV, pk.-pk., 20 MHz. bandwidth.

### REMOTE SENSING

On 5V main/singles which are fully isolated from all auxiliaries.

### HOLDUP TIME

20 milliseconds after loss of nominal AC power.

### EFFICIENCY

80% typ.

### OVERVOLTAGE PROTECTION

Standard on main output/singles.  
Optional on auxiliaries.

### OPERATING TEMPERATURE

0-70°C.  
Derate 2%/°C above 50°C to 70°C.

### TEMPERATURE COEFFICIENT

5V main/4th aux./singles	±0.02%/°C
Other auxiliaries	±0.05%/°C

### OVERLOAD

Outputs short circuit protected by current foldback with automatic recovery.

### REVERSE VOLTAGE PROTECTION

All outputs are protected up to load ratings.

### SAFETY

Internal modules meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805.

### LEAKAGE CURRENT

0.75 mA at 115 VAC, 60 Hz. input.

### SPACING

8 mm primary to secondary.  
4 mm primary to grounded circuits.

### DIELECTRIC WITHSTAND

3750 VRMS input to ground.  
3750 VRMS input to output.  
700 VDC output to ground.

### OUTPUT POLARITY

Singles/4th aux./main outputs all floating.  
Other auxiliaries share a common terminal.

### EMISSIONS

Units meet FCC 20780 Part 15 Class A and VDE 0871/6.78 Class A for conducted emissions. Compliance with Class B limits by use of additional external filter.

### AC UNDERVOLTAGE

Low line lockout circuit protects against damage for undervoltage operation.

### SOFT START

Units have soft start feature to protect critical components.

### DYNAMIC RESPONSE

Peak transient less than ±2% or ±200 mV for step load change from 75% to 50% or 100% max. ratings.

### RECOVERY TIME

Less than 400 microseconds on main/4th aux./singles output.

### INHIBIT

Optional TTL logic inhibit input.

### THERMAL SHUTDOWN

Optional circuit cuts off supply in case of local over temperature. Unit resets automatically if excess temperature abates.

### POWER FAIL MONITOR

Optional monitor provides a TTL signal 2 ms. min. prior to loss of output power with outputs fully loaded from 100VAC/200VAC line loss.

### AUTO RANGER

Optional circuit provides automatic operation at specified input ranges without strapping.

### SHOCK

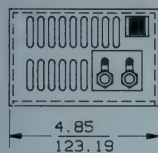
MIL-STD 810-D Method 516.3, Procedure III.

### VIBRATION

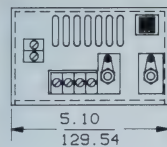
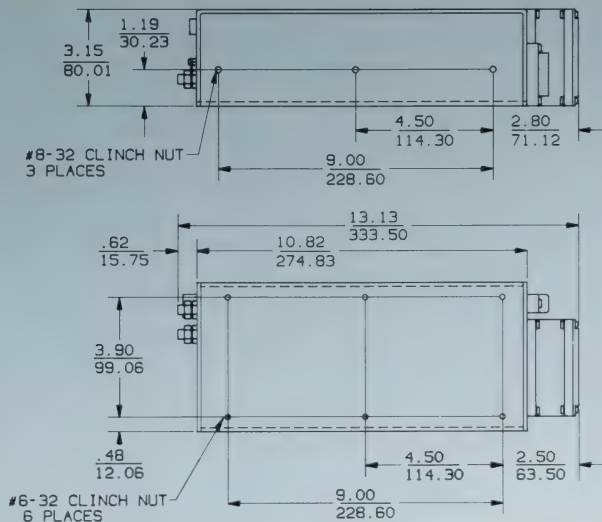
MIL-STD 810-D Method 514.3, Category 1, Procedure I.

# DIMENSIONS

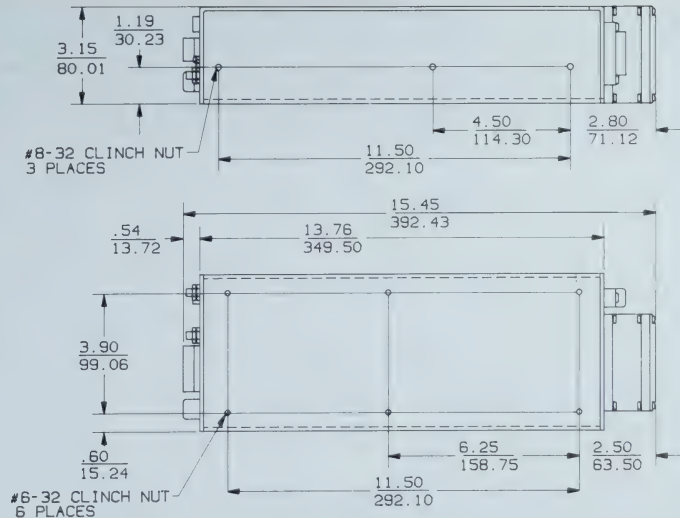
inches  
mm



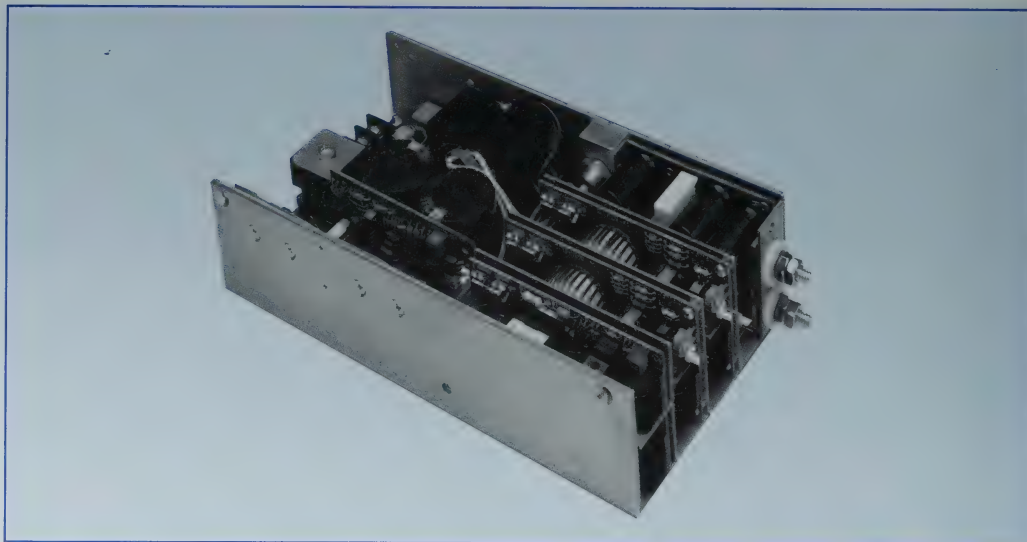
CASE SIZE A



CASE SIZE B



# ULTRA COMPACT MODUFLEX® SWITCHERS



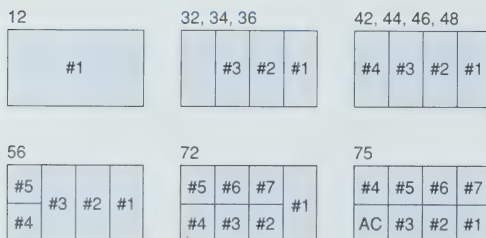
## DESCRIPTION

Moduflex® switchers form a comprehensive line of open frame power supplies that are ideally suited for a large variety of industrial and commercial applications including computers, industrial controls, telecommunications, VME/VXibus systems, etc. Units in this modular family offer power densities up to 10 watts per cubic inch. The design features "State of the Art" topology, a meticulous thermal structure and the use of high efficiency circuits and components to attain the outstanding power density.

The modular system concept reduces manufacturing to submodule assembly, capable of high volume production with a superior quality level.

Moduflex switchers are available in power ratings of 200 to 1500 watts with both AC and DC inputs.

## OUTPUT LOCATIONS\*



\*Case 6 output locations are numbered counter-clockwise from the left.

## FEATURES

- UL, CSA, TUV (IEC, VDE) design. CB Test Certification in process.
- 10 watts per cubic inch.
- 1-7 outputs. 200-1500 watts.
- 120 kilohertz MOSFET design.
- All outputs:
  - Adjustable
  - Fully regulated
  - Floating
  - Overload and short circuit proof
  - Overvoltage protected
- Standard features include:
  - System inhibit
  - Load proportional DC fan output
- Options include:
  - Auto Ranger
  - Power fail monitor
  - Quick connects
  - Cover
  - Fan cover
  - Active surge limit
- VME power fail module accessory.
- VXibus filter module accessory.
- Fast delivery.
- Replaces expensive high density systems using potted modules.

## M • DM SERIES

### General Purpose and DC input single output

DC Input	Model	Output	Max Power	Config Code	Case Size
D	M12A2-YY	5V/80A	400W	12	1
D	M12A3-YY	12V/34A	400W	12	1
D	M12A4-YY	15V/26A	400W	12	1
D	M12A6-YY	24V/17A	400W	12	1
	M12B2-YY	5V/100A	500W	12	1
	M12B3-YY	12V/42A	500W	12	1
	M12B4-YY	15V/33A	500W	12	1
	M12B6-YY	24V/21A	500W	12	1
	M12B9-YY	48V/10A	500W	12	1
D	M12C2-YY	5V/120A	600W	12	2
D	M12C3-YY	12V/50A	600W	12	2
D	M12C4-YY	15V/40A	600W	12	2
D	M12C6-YY	24V/25A	600W	12	2
	M12D2-YY	5V/150A	750W	12	2
	M12D3-YY	12V/62A	750W	12	2
	M12D4-YY	15V/50A	750W	12	2
	M12D6-YY	24V/31A	750W	12	2
	M12D9-YY	48V/16A	750W	12	2

Add prefix D to model number where applicable to specify DC input.  
Other voltages, e.g. 2V, 3.3V, 28V, and 48V available on special order.



## ACCESSORIES

### VME POWER FAIL MODULE

Model PF-VME power fail module is an auto ranging stand-alone module that gives both ACFAIL and SYSRESET in accordance with VMEbus standards. See page 29 for complete specifications.

### VXibus FILTER MODULES

F1, F2 and F3 accessory modules enable VX Series units to meet VXI ripple and noise specifications and provide IMD per table. IMD ratings are from 2 Hz to 12.5 kHz and will follow the IMD curve to 100 kHz.

### FILTER IMD RATINGS

Model	Nom. Voltage			
	2	5	12	24
F1	2A	2A	2A	6A
F2	6A	6A	—	—
F3	10A	10A	—	—

## VM SERIES

### Super compact single output

Model	Output	Max Power	Config Code	Case Size
VM12D2-YY	5V/150A	750W	12	5
VM12D3-YY	12V/72A	864W	12	5
VM12D4-YY	15V/57A	855W	12	5
VM12D6-YY	24V/36A	864W	12	5

## VX SERIES—VXIbus switchers

Output Number	Models			
	VX1B-YY	VX1D-YY	VX1E-YY	VX1F-YY
1	5V/30A	5V/60A	5V/80A	5V/120A
2	2V/10A	2V/12A	2V/20A	2V/30A
3	5V/10A	5V/12A	5V/20A	5V/30A
4	12V/6A	12V/8A	12V/10A	12V/15A
5	12V/6A	12V/8A	12V/10A	12V/15A
6	24V/3A	24V/4A	24V/5A	24V/8A
7	24V/3A	24V/4A	24V/5A	24V/8A
Max Power	500W	750W	1000W	1500W
Config Code	72	72	75	75
Case Size	1	2	3	4

On models VX1E-YY and VX1F-YY the max. total power for the sum of outputs #1 to #3 must not exceed 500 watts and 750 watts respectively.

## OPTIONS

Option Code	Function
00	None
01	Power Fail Monitor
02	Auto Ranger
04	Quick Connects—all auxiliaries
08	Active Surge Limit
32	Cover
64	Fan Cover

### NOTES:

1. To order, replace "YY" with sum of Option Codes desired.
2. Options 02 and 08 mutually exclusive.
3. Model VX1E-YY and VX1F-YY include built-in fan.

## M • DM • VM SERIES—General purpose, DC input and VME multiple outputs

DC Input	Model	Output					Max Power	Config Code	Case Size
		1	2	3	4	5			
	M32P233-YY	5V/30A	12V/6A	12V/6A			250W	32	6
	M34R233-YY	5V/40A	12V/12A	12V/6A			350W	34	6
	M42P2233-YY	5V/30A	5V/10A	12V/6A	12V/6A		250W	42	6
	M42P2336-YY	5V/30A	12V/6A	12V/6A	24V/3A		250W	42	6
	M44R2323-YY	5V/40A	12V/12A	5V/10A	12V/6A		350W	44	6
	M44R2633-YY	5V/40A	24V/6A	12V/6A	12V/6A		350W	44	6
D	M34A233-YY	5V/60A	12V/12A	12V/6A			400W	34	1
	M36B233-YY	5V/80A	12V/12A	12V/12A			500W	36	1
D	M36C233-YY	5V/100A	12V/12A	12V/12A			600W	36	2
	M36D233-YY	5V/120A	12V/12A	12V/12A			750W	36	2
D	VM1A-YY	5V/50A	12V/12A	5V/10A	12V/6A		400W	44	1
D	VM2A-YY	5V/50A	24V/6A	12V/6A	12V/6A		400W	44	1
D	VM3A-YY	5V/60A	12V/12A	5V/10A	12V/6A		400W	44	1
D	VM4A-YY	5V/60A	24V/6A	12V/6A	12V/6A		400W	44	1
	VM1B-YY	5V/80A	12V/12A	12V/12A	5V/10A		500W	46	1
	VM2B-YY	5V/80A	12V/12A	24V/6A	12V/6A		500W	46	1
D	M46C2332-YY	5V/100A	12V/12A	12V/12A	5V/10A		600W	46	2
D	M46C2363-YY	5V/100A	12V/12A	24V/6A	12V/6A		600W	46	2
	M48D2233-YY	5V/120A	5V/20A	12V/12A	12V/12A		750W	48	2
	M48D2336-YY	5V/120A	12V/12A	12V/12A	24V/6A		750W	48	2
	VM3B-YY	5V/80A	12V/12A	24V/6A	5V/10A	12V/6A	500W	56	1
	VM1D-YY	5V/120A	12V/12A	24V/6A	5V/10A	12V/6A	750W	56	2

Add prefix D to model number where applicable to specify DC input.

## SPECIFICATIONS

### INPUT

90-132 VAC or 180-264 VAC, 47-440 Hz. Strappable.  
40-60 VDC for DM Series.

### INPUT SURGE

34 Amps peak from cold start for units under 1000W, 68 Amps for other models.

### HOLDUP TIME

20 milliseconds from loss of nominal AC power.  
3 milliseconds for DM Series.

### OUTPUTS

See model selection table.

### ADJUSTABILITY

±5% trim adjustment. On VX Series all 5VDC outputs are adjustable up to 5.2VDC @ full output.

### OUTPUT POLARITY

All outputs are floating from chassis and each other and can be referenced to each other or ground as required.

### LINE REGULATION

Less than ±0.1% or ±5mV for input changes from nominal to min. or max. rated values.

### LOAD REGULATION

±0.2% or ±10mV for load changes from 50% to 0% or 100% of max. rated values.

### MINIMUM LOAD

Main output requires a 10% minimum load for full output from auxiliaries.

### REMOTE SENSING

On all outputs except those less than 100 watts and less than 20 Amps.

### RIPPLE & NOISE

1% or 100mV pk-pk, 20 MHz bandwidth.

### OPERATING TEMPERATURE

0-70°C. Derate 2.5%/°C above 50°C.

### COOLING

A min. of 6 LFS\* for models under 400W, 10 LFS for others, directed over the unit for full rating. Two test locations on chassis rated for max. temperature of 90°C. 1000W and 1500W units have built-in fan. For convection rating on 250W units derate output currents by 30% and max. power by 20%.

\*Linear feet/second.

### TEMPERATURE COEFFICIENT

±0.02%/°C.

### EFFICIENCY

80% typical.

### SAFETY

Units meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805. Certifications in process.

### DIELECTRIC WITHSTAND

3000 VRMS input to ground.  
3000 VRMS input to output.  
700 VDC output to ground.

### SPACING

5 mm primary to secondary.  
2.5 mm to grounded circuits.

### LEAKAGE CURRENT

0.75 mA at 115 VAC 60Hz. input.  
1.5 mA for 1000 watt and 1500 watt models.  
Not applicable to DM units.

### EMISSIONS

Units meet FCC 20780 Part 15 Class A and VDE 0871/6.78 Class A for conducted emissions. Compliance with Class B limits

by use of additional external filter. DM Series also meet Bellcore TR-TSY-000515.

### DYNAMIC RESPONSE

Peak transient less than ±2% or ±200mV for step load change from 75% to 50% or 100% of max. ratings.

### RECOVERY TIME

Recovery within 1%.  
Main output—200 microseconds.  
Auxiliary outputs—500 microseconds.

### INPUT UNDERVOLTAGE

Protects against damage for undervoltage operation.

### OVERVOLTAGE PROTECTION

Standard on all outputs.

### REVERSE VOLTAGE PROTECTION

All outputs are protected up to load ratings.

### OVERLOAD & SHORT CIRCUIT

Outputs protected by duty cycle current foldback circuit with automatic recovery. Auxiliaries have additional backup fuse protection.

### THERMAL SHUTDOWN

Circuit cuts off supply in case of local over temperature. Units reset automatically when temperature returns to normal.

### SOFT START

Units have soft start feature to protect critical components.

### FAN OUTPUT

Nominal 12VDC @ 12 watts maximum.  
Not provided on models less than 400W.

### INHIBIT

TTL compatible system inhibit provided.

### SHOCK

MIL-STD 810-D Method 516.3, Procedure III.

### VIBRATION

MIL-STD 810-D Method 514.3, Category 1, Procedure I.

### MECHANICAL

CASE	WATTS	H	x	W	x	L
1	400W/500W	2.50"	x	5.05"	x	9.00"
2	600W/750W	2.50"	x	5.20"	x	9.63"
3	1000W	5.00"	x	5.05"	x	10.40"
4	1500W	5.00"	x	5.20"	x	11.00"
5	860W	2.50"	x	5.00"	x	6.85"
6	250W/350W	2.50"	x	4.00"	x	8.00"

### POWER FAIL MONITOR

Optional circuit provides isolated TTL and VME compatible ACFail signal providing 4 milliseconds warning before main output drops by 5% after an input failure. Available on multiple output units and 5V singles.

### AUTO RANGER

Option circuit provides automatic operation at specified input ranges without strapping. Not available on DM or single output VM units.

### QUICK CONNECTS

Dual .187 quick connect tab terminals.

### ACTIVE SURGE LIMIT

Limits input surge to less than 18 Amps, and provides rapid reset.

### COVER

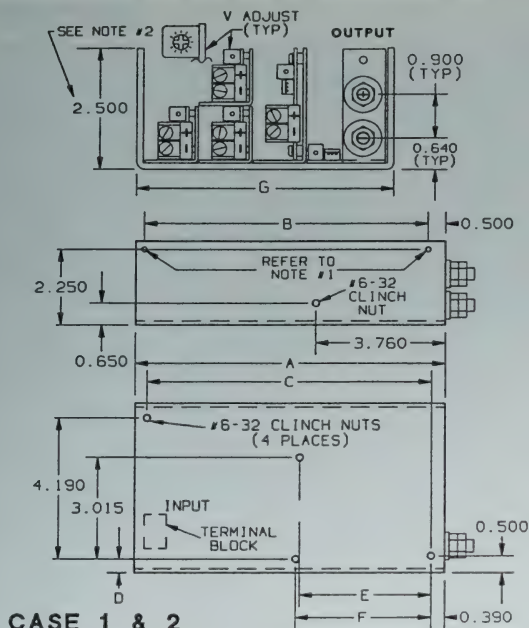
Optional flat cover recommended when customer supplied fan cooling is directed through the length of the unit.

### FAN COVER

Optional cover with brushless DC ball bearing fan which provides the required air flow for full rating of Moduflex power supplies.

### EXTENDER BRACKETS

Model P51988-1 extender bracket accessory. Facilitates multiple connections to auxiliary output modules. Order with unit.



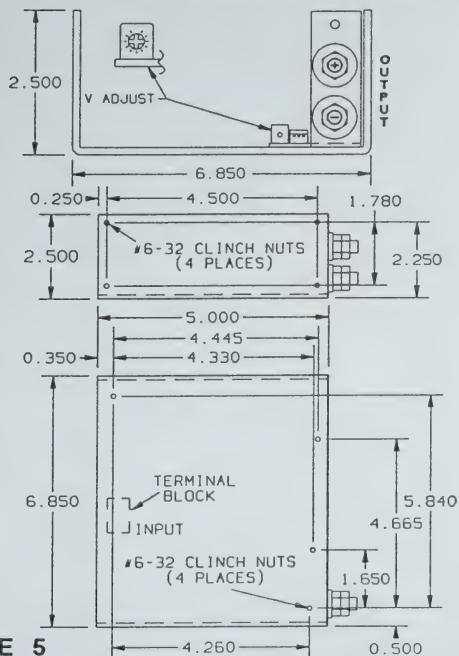
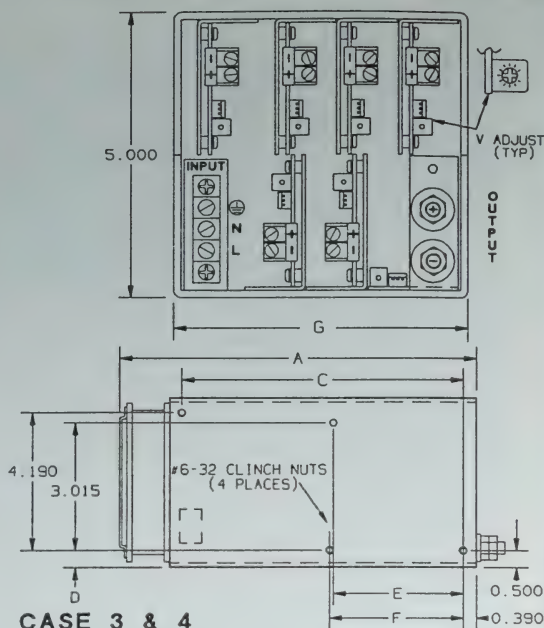
CASE 1 & 2

NOTES:

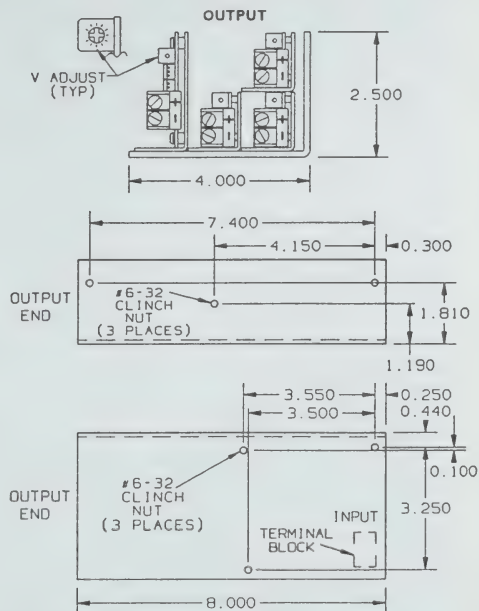
- (1) WITH COVER (#6-32).  
W/O COVER (.150 DIA.)
- (2) UNIT HEIGHT WITH  
FAN COVER (4.100)
- (3) TERMINAL BLOCKS (#6-32)
- (4) STUDS (1/4-20)

CASE	1	2	3	4
WATTS	400/500	600/750	1000	1500
A	9.000	9.630	10.400	11.000
B	8.250	8.880	8.880	8.880
C	8.260	8.890	8.260	8.890
D	.410	.500	.410	.500
E	3.820	4.450	3.820	4.450
F	3.930	4.560	3.930	4.560
G	5.050	5.200	5.050	5.200

CASE 3 & 4



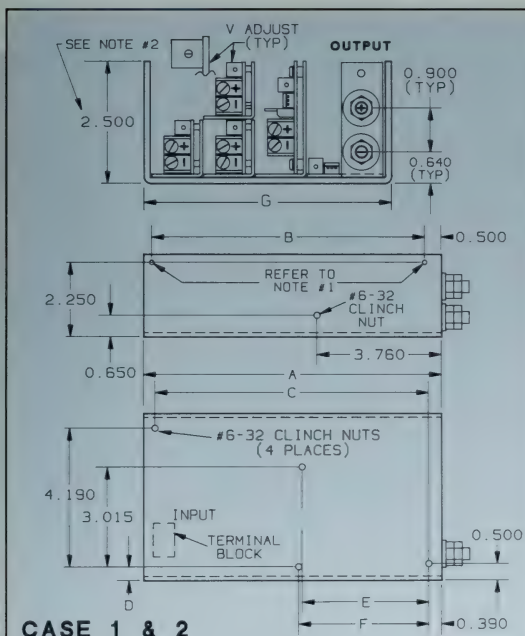
CASE 5



CASE 6



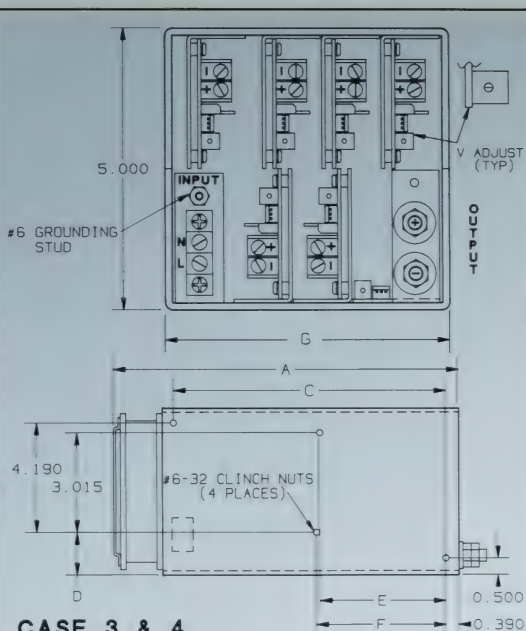
# DIMENSIONS



**CASE 1 & 2**

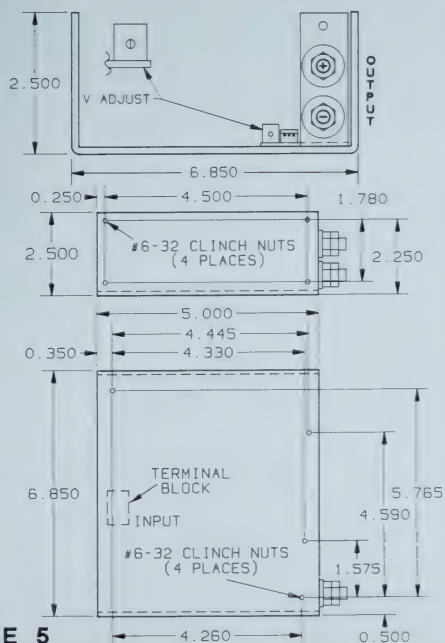
## NOTES:

- (1) WITH COVER (#6-32).  
W/O COVER (.150 DIA.)
- (2) W/FAN COVER UNIT HEIGHT (4.100)
- (3) TERMINAL BLOCKS (#6-32)
- (4) STUDS (1/4-20)

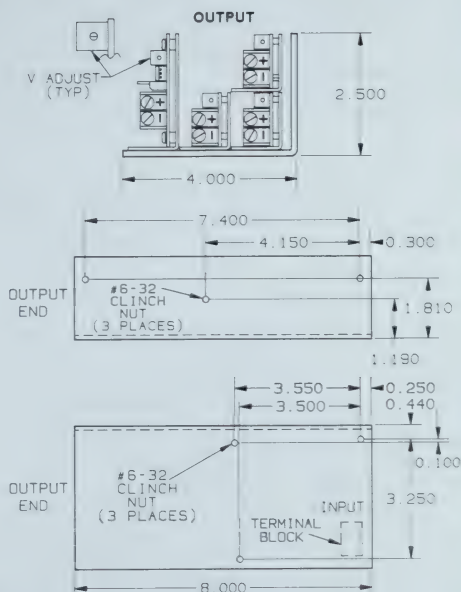


**CASE 3 & 4**

	CASE 1 400/500 W	CASE 2 600/750 W	CASE 3 1000 W	CASE 4 1500 W
A	9.000	9.630	10.400	11.000
B	8.250	8.880	9.630	10.250
C	8.260	8.890	9.640	10.260
D	.410	.425	.410	.425
E	3.820	4.450	3.820	4.450
F	3.930	4.560	3.930	4.560
G	5.050	5.200	5.050	5.200



**CASE 5**



**CASE 6**

# 0.99 PFC MODUFLEX® SWITCHERS

## Sine Wave Current • Harmonics Meet IEC 555-2



**1000 Watts Output Without  
Exceeding UL Limits For  
Ordinary Duplex Outlets**

### DESCRIPTION

The FM Series is derived from our line of ultra compact Moduflex® switchers. New input modules incorporate power factor correction. The resultant input current wave form is nearly a perfect sine wave compliant to the harmonic requirements of IEC 555-2.

This series offers a power density of 4 watts per cubic inch at an ambient temperature of 50°C. FM Series models are available for a large variety of industrial and commercial applications in single and multiple outputs with power ratings of 600 to 2000 watts.

Modular construction permits high volume manufacturing with an outstanding quality level and allows us to deliver your units on time at a competitive cost.

### FEATURES

- 0.99 power factor.
- 4 watts per cubic inch.
- 1-4 outputs, 600-2000 watts.
- 120 kilohertz MOSFET design.
- Universal input.
- UL, CSA, TUV (IEC, VDE) design. CB Test Certification in process.
- All outputs:
  - Adjustable*
  - Fully regulated*
  - Floating*
  - Overload and short circuit proof*
  - Overvoltage protected*
- Standard features include:
  - System inhibit*
  - Fan output*
- Options include:
  - Power fail monitor*
  - Quick connects*
  - End or top fan covers*
- VME power fail module accessory.

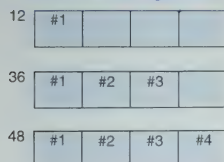
## MODELS & RATINGS—General purpose single and multiple outputs

Model	Output				Max Power	Config Code	Case Size
	1	2	3	4			
FM12C2-YY	5V/120A				600W	12	1
FM12C3-YY	12V/50A				600W	12	1
FM12C4-YY	15V/40A				600W	12	1
FM12C6-YY	24V/25A				600W	12	1
FM12C9-YY	48V/12A				600W	12	1
FM11E2-YY	5V/200A				1000W	11	2
FM11E3-YY	12V/84A				1000W	11	2
FM11E4-YY	15V/67A				1000W	11	2
FM11E6-YY	24V/42A				1000W	11	2
FM11E9-YY	48V/21A				1000W	11	2
FM36C233-YY	5V/80A	12V/12A	12V/12A		600W	36	1
FM48C2233-YY	5V/80A	5V/20A	12V/12A	12V/12A	600W	48	1
FM48C2336-YY	5V/80A	12V/12A	12V/12A	24V/6A	600W	48	1
FM31E233-YY	5V/150A	12V/24A	12V/24A		1000W	31	2
FM43E2332-YY	5V/150A	12V/20A	12V/20A	5V/20A	1000W	43	2
FM43E2363-YY	5V/150A	12V/20A	24V/12A	12V/12A	1000W	43	2
FM45G2633-YY	5V/200A	24V/31A	12V/24A	12V/24A	2000W	45	3

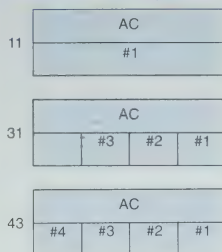
Other voltages, e.g. 2V, 3.3V, 28V, and 48V available on special order.

## OUTPUT LOCATIONS

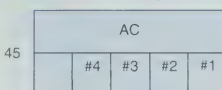
### 600 Watt FM Configurations



### 1000 Watt FM Configurations

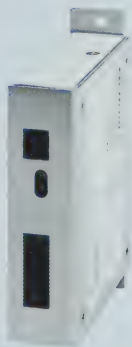


### 2000 Watt FM Configurations



**OPTIONS** – To order, replace YY in model numbers with sum of Option Codes desired.

Option Code	Function
0	None
1	Power Fail Monitor
2	Quick Connects—all aux's
4	End Fan Cover (600W only)
8	Top Fan Cover (600W only)



## VME POWER FAIL MODULE

Model PF-VME power fail module is a stand-alone unit which monitors the AC mains/line voltage and the DC 5 volt logic output.

Both ACFAIL and SYSRESET logic outputs are switched in accordance with VME specifications when input voltage is either above or below a user adjustable threshold. This unit features auto-ranging for both nominal 115/230 VAC operation.

Logic alarms are also presented when the 5 volt output drops below a user adjustable threshold.

See page 29 for complete specifications.

## SPECIFICATIONS

### INPUT

90-264 VAC, 47-63 Hz.  
190-264 VAC for 2000W units.

### POWER FACTOR

0.99 at full load.

### HARMONIC CURRENTS

Compliant to IEC 555-2.

### INPUT SURGE

230 VAC – 75A max.  
115 VAC – 40A max.

### HOLDUP TIME

20 milliseconds from loss of AC power.

### OUTPUTS

See model selection table.

### ADJUSTABILITY

±5% trim adjustment.

### OUTPUT POLARITY

All outputs are floating from chassis and each other and can be referenced to each other or ground as required.

### LINE REGULATION

Less than ±0.1% or ±5mV for input changes from nominal to min. or max. rated values.

### LOAD REGULATION

±0.2% or ±10mV for load changes from 50% to 0% or 100% of max. rated values.

### MINIMUM LOAD

Main output requires a 10% minimum load for full output from auxiliaries. Main output is #1 on 600W and 1000W units and #2 on 2000W units.

### REMOTE SENSING

On all outputs.

### RIPPLE & NOISE

1% or 100mV pk.-pk., 20 MHz bandwidth.

### OPERATING TEMPERATURE

0-70°C. – Derate 2.5%/°C above 50°C.

### COOLING

A min. of 10 LFS cooling air directed on cooling surfaces over the 600W units for full rating. Two test locations on chassis rated for max. temperature of 90°C. 1000W and 2000W models have built-in ball bearing fan.

### TEMPERATURE COEFFICIENT

±0.02%/°C.

### EFFICIENCY

70% to 80%.

### SAFETY

Units meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805. Certifications in process.

### DIELECTRIC WITHSTAND

3000 VRMS input to ground.  
3000 VRMS input to output.  
700 VDC output to ground.

### SPACING

5 mm primary to secondary.  
2.5 mm primary to grounded circuits.

### LEAKAGE CURRENT

3.5 mA max.

### EMISSIONS

Units meet FCC 20780 Part 15 Class A and VDE 0871 Class A for conducted emissions. Compliance with Class B limits by use of additional external filter.

### DYNAMIC RESPONSE

Peak transient less than ±2% or ±200mV for step load change from 75% to 50% or 100% max. ratings.

### RECOVERY TIME

Recovery within 1%.  
Output #1 all units & output #2 on 2kW – 200 microseconds.  
All other outputs – 500 microseconds.

### INPUT UNDERVOLTAGE

Protects against damage for undervoltage operation.

### OVERVOLTAGE PROTECTION

Standard on all outputs.

### REVERSE VOLTAGE PROTECTION

All outputs are protected up to load ratings.

### OVERLOAD & SHORT CIRCUIT

Outputs protected by duty cycle current foldback circuit with automatic recovery. Auxiliaries have additional backup fuse protection.

### THERMAL SHUTDOWN

Circuit cuts off supply in case of local over temperature. Units reset automatically when temperature returns to normal.

### SOFT START

Units have soft start feature to protect critical components.

### FAN OUTPUT

Nominal 12 VDC @ 12 watts maximum.

### INHIBIT

TTL compatible system inhibit provided.

### SHOCK

MIL-STD 810-D Method 516.3, Procedure III.

### VIBRATION

MIL-STD 810-D Method 514.3, Category 1, Procedure I.

### MECHANICAL

600W – Case 1. – 2.5 x 5.05 x 12  
1000W – Case 2. – 5.05 x 5.05 x 12  
2000W – Case 3. – 5.05 x 8 x 12

### POWER FAIL MONITOR

Optional circuit provides isolated TTL and VME compatible ACFAIL signal providing 4 milliseconds warning before main output drops by 5% after an input failure.

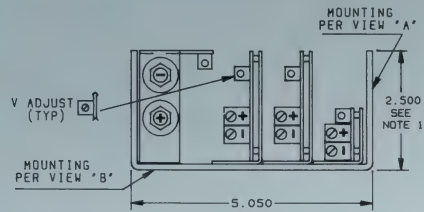
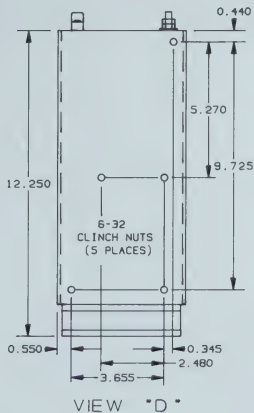
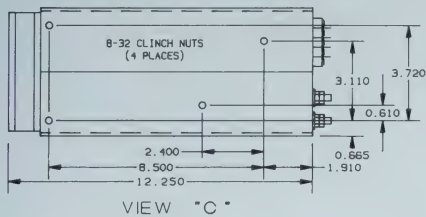
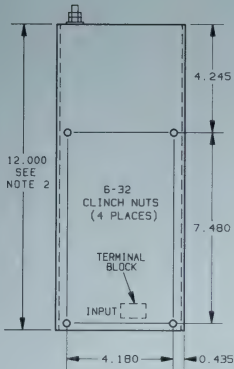
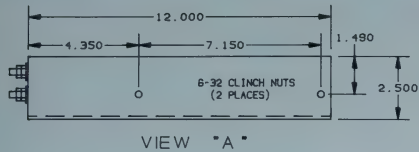
### QUICK CONNECTS

Dual .187 quick connect tab terminals.

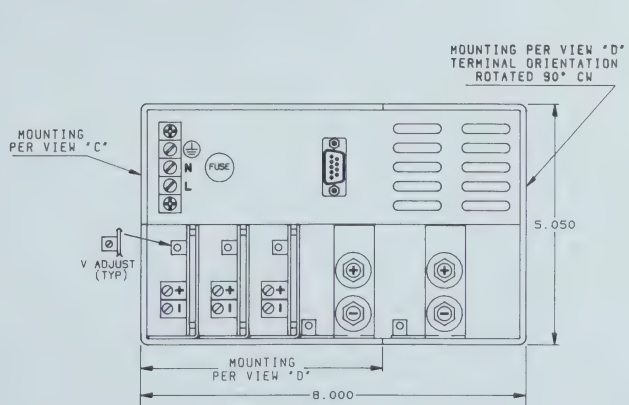
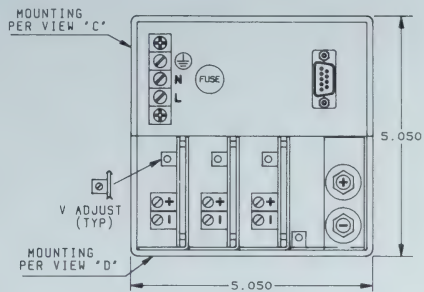
### FAN COVER

Optional covers with brushless DC ball bearing fan which provides the required air flow for full rating of 600W units. Choice of low profile or top mounted types.

## DIMENSIONS



- NOTES:
1. WITH TOP FAN COVER  
UNIT HEIGHT (4.100)
  2. WITH END FAN COVER  
UNIT LENGTH (13.300)
  3. TERMINAL BLOCKS (6-32).
  4. STUDS (1/4-20).



# 0.99 PF & HARMONIC CORRECTOR



## DESCRIPTION

Model PFC-555 is a stand alone unit that will correct the power factor of switching power supplies to 0.99 and reduce harmonics in accordance with IEC 555-2 specifications. This corrector will work with most off line switchers.

One unit can handle up to 1300 watts input for voltages from 90 to 264 VAC and 2600 watts for voltages from 187 to 264 VAC. The PFC-555 is ideally suited to be used as a front end for existing switchmode power supply systems.

## APPLICATION

Model PFC-555 can be used as a power factor and harmonic correcting front-end for one or more switchmode power supplies with a maximum DC output of 1000 watts, assuming a typical 77% efficiency. For high powered systems, where the input voltage usually is in the range of 187-264 VAC, the unit can support one or more switchmode power supplies with a combined output of 2000 watts. This unit is designed to power any Deltron Series M unit, but can also be successfully used with off-line switchmode power supplies of other manufacturers. In applying the PFC-555, it is important that the switchmode supplies are connected for high input range operation. The preferred interconnection is into the DC input terminals, if these are available. If these are not available, the connection can be made to the primary input terminals.

## FEATURES

- 0.99 power factor.
  - 1300-2600 watts.
  - Universal input.
  - Harmonics meet IEC 555-2.
  - UL, CSA, TUV, (IEC, VDE) design.
- CB Test Certification in Process.

## SPECIFICATIONS

### INPUT

90-264 VAC, 47-63 Hz.

### INPUT SURGE

115 VAC—34A max.

230 VAC—68A max.

### POWER FACTOR

0.99 typical at full load for input of  
90 to 264 VAC.

### HARMONIC DISTORTION

Less than IEC 555-2 limits.

### OUTPUT VOLTAGE

375 VDC.

### OUTPUT POWER

1300 watts for input of 90 to 264 VAC.

2600 watts for input of 187 to 264 VAC.

### LINE REGULATION

3% for line changes from 90 to 264 VAC.

### LOAD REGULATION

3% for load changes from no load to  
full load.

### RIPPLE & NOISE

30 volts pk.-pk.

### EFFICIENCY

91% with input of 90 to 264 VAC.

93% with input of 187 to 264 VAC.

### DIELECTRIC WITHSTAND

3000 VAC input to ground.

### SPACING

2.5mm primary to grounded circuits.

### INPUT PROTECTION

IEEE-587 Class A for branch circuits.

### LEAKAGE CURRENT

Less than 3.5 mA.

### OVERLOAD

Protection provided by externally  
accessible fuse.

### OPERATING TEMPERATURE

0°C to 70°C. Derate 2.5%/°C above 50°C.

### STORAGE TEMPERATURE

-55°C to 85°C.

### COOLING

Integral ball bearing fan.

### SAFETY

Units meet UL 1950, CSA 22.2 No. 234,  
EN 60 950, IEC 950, VDE 0805.

Certifications in process.

### EMISSIONS

Integral differential and common mode  
filter to facilitate system compliance to  
FCC 20780 Part 15 Class A and VDE  
0871 Class A.

### SHOCK

MIL-STD 810D Method 516.3,  
Procedure III.

### VIBRATION

MIL-STD 810D Method 514.3,  
Category 1, Procedure I.

### MECHANICAL

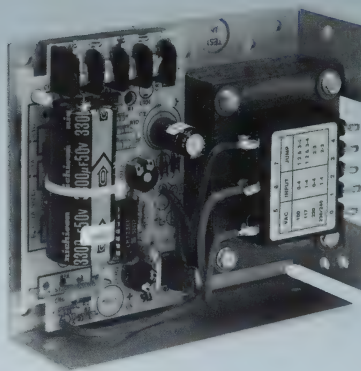
3.80"H X 5.05"W X 10.06"L.

# WORLD SERIES & SUPER RATED LINEARS

**R Series**  
25% More Power



**W Series**  
Worldwide Input



## DESCRIPTION

### WORLD SERIES

The World Series consists of single and multiple output open frame power supplies. Each model uses a specially designed split bobbin transformer enabling the units to meet the most stringent international safety standards for leakage and isolation. As the name World Series implies, the units are designed to operate from any worldwide input voltage. Multiples have anti latch circuitry to handle high surge and cross coupled loads. World Series supplies come in 13 different chassis configurations each conforming to the industry standard footprints. All outputs are isolated and have barrier block output terminations. These features combine to make the World Series an ideal choice for critical commercial and industrial applications.

### R SERIES

The R Series comprise single output linear power supplies. These super rated models deliver 25 percent more output power than the comparable competitive units of the same mechanical size. This is accomplished by using a more efficient regulator, larger filter capacitors and more efficient transformers. Where space is at a premium the R Series offers an effective solution.

### FEATURES

- UL, CSA, TUV (IEC, VDE) certified\*. CB Test Certification in process.
- FCC, VDE EMI.
- 1-3 outputs.
- 15-300 watts.
- All isolated outputs.
- Barrier block interface.
- Up to 200,000 hours MTBF.
- Competitive prices.
- Fast delivery.

\*Most models

## MODELS & RATINGS

### WORLD SERIES—SINGLE OUTPUT

Model	Output Voltage	Amps	Case Size
W100A	5	3	A
W101B	5	6	B
W102C	5	9	C
W103D	5	12	D
W120F	5	18	F
W121G	5	27	G
W104A	12	1.7	A
W105B	12	3.4	B
W106C	12	5.1	C
W107D	12	6.8	D
W122F	12	10.8	F
W123G	12	17.1	G
W108A	15	1.5	A
W109B	15	3	B
W110C	15	4.8	C
W111D	15	6	D
W124F	15	9.5	F
W125G	15	14.4	G
W112A	24	1.2	A
W113B	24	2.4	B
W114C	24	3.6	C
W115D	24	4.8	D
W126F	24	7.2	F
W127G	24	9.9	G
W116A	48	0.5	A
W117B	48	1.0	B
W118D	48	3	D

### R SERIES—SUPER RATED

Model	Output Voltage Adj.±5%	Amps	Case Size
R5-3.8	5	3.8	A
R5-7.5	5	7.5	B
R5-11.2	5	11.2	C
R5-15.0	5	15.0	D
R5-22.5	5	22.5	F
R5-33.7	5	33.7	G
R12-2.1	12	2.1	A
R12-4.2	12	4.2	B
R12-7.1	12	7.1	C
R12-8.8	12	8.8	D
R12-13.5	12	13.5	F
R12-21.4	12	21.4	G
R15-1.9	15	1.9	A
R15-3.8	15	3.8	B
R15-6.0	15	6.0	C
R15-7.9	15	7.9	D
R15-11.9	15	11.9	F
R15-18.0	15	18.0	G
R24-1.5	24	1.5	A
R24-3.0	24	3.0	B
R24-4.1	24	4.1	C
R24-6.0	24	6.0	D
R24-9.0	24	9.0	F
R24-12.4	24	12.4	G

### WORLD SERIES—DUAL & TRIPLE OUTPUTS

Model	Output #1		Output #2		Output #3		Case Size
	Volts	Amps	Volts	Amps	Volts	Amps	
W208A	5/12/15	.4/1/.8	5/12/15	.4/1/.8	—	—	DA
W209B	5/12/15	.7/1.7/1.5	5/12/15	.7/1.7/1.5	—	—	DB
W210C	5/12/15	1.5/3.4/3	5/12/15	1.5/3.4/3	—	—	DC
W205C	5	2	12	4	—	—	DC
W300A	5	2	5/9-15	.2/4	5/9-15	.2/4	TA
W301D	5	3	5/12-15	.4/1/.8	5/12/15	.4/1/.8	TD
W318D	5	6	5/9-15	.7/1.5	5/9-15	.7/1.5	TD
W302E	5	6	5/12/15	.7/1.7/1.5	5/12/15	.7/1.7/1.5	TE
W303E	5	8	5/12/15	.7/1.7/1.5	5/12/15	.7/1.7/1.5	TE
W304F	5	12	5/12/15	.7/1.7/1.5	5/12/15	.7/1.7/1.5	TF
W325E	5	6	12	1.2	24	3.5/8p	TE
W308E	5	3	5	.6	24	5/6p	TE
W305G	5	12	5/12/15	1.5/3.4/3	5/12/15	1.5/3.4/3	TG
W314B	5	4	5/9-15	.5/1	5/9-15	.5/1	TB

Corresponding ratings separated by slash marks are alternate field selectable ratings for the designated output. All units have anti latch circuitry to handle high surge and cross coupled loads.

### CROWBAR OVERVOLTAGE PROTECTOR

All 5 volt World Series single output units have a built-in fixed crowbar overvoltage protector. Multiples also have this type of built-in crowbar on Output #1 when its voltage is specified as 5 volts only. CB Series accessory crowbar protectors are available for other models and are selected from the adjacent chart.

Voltage Range	0-15 Amp	15-36 Amp
6-15	CB41	CB51
15-30	CB42	CB52

## WORLD SERIES SPECIFICATIONS

### INPUT

100, 120, 220, 230, 240 VAC +10%, -13%, 47-63 Hz.  
For 230 VAC +15%, -10%.

Derate output current 10% for 50 Hz. operation.

### OUTPUT

See table of models. Outputs are adjustable  $\pm 5\%$ .

### OPERATING TEMPERATURE

0°C to 50°C full rated, derate linearly to 40% at 71°C.

### STORAGE TEMPERATURE

-20°C to 85°C

### SAFETY

Units meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805.

### DIELECTRIC WITHSTAND VOLTAGE

Input to ground - 3750 VAC

Input to output - 3750 VAC

Output to ground - 700 VDC

### LEAKAGE CURRENT

Less than 50 microamps.

### CREEPAGE DISTANCE

Greater than 9mm line connected metal parts to dead metal.

### LINE REGULATION

$\pm 0.05\%$  for a 10% line change.

### LOAD REGULATION

$\pm 0.05\%$  for a 50% load change.

### RIPPLE & NOISE

1 mV rms, 5 mV pk.-pk.

### PEAK CURRENTS

Numbers after a slash mark followed by a lower case "p" are surge ratings that units deliver for approximately 500 milliseconds.

### TEMPERATURE COEFFICIENT

0.03% per °C.

### STABILITY

$\pm 0.1\%$  typical for 8 hours after warm up.

### RECOVERY TIME

30 microsec typical for full line changes or 100% load increase.

### REMOTE PROGRAMMING

1000 ohms per volt approximately.

### REMOTE SENSING

Built in capability with loss of sense protection.

### OVERLOAD & SHORT CIRCUIT PROTECTION

Adjustable auto-recovery foldback current limiting; time delayed with a second foldback loop in units with surge current capability.

### REVERSE VOLTAGE PROTECTION

Provided on outputs and pass elements.

### OVERVOLTAGE PROTECTION

All 5 volt models have built in fixed crowbar.  
See adjacent page for OVP on other outputs.

### INTERFACE

Input solder lugs, output barrier block terminals.

### MOUNTING

3 to 4 mounting surfaces, 5 orientations.

### MECHANICAL

Refer to drawings for dimensions, parts locations and weight.

### EMI

Meet FCC 20780 and VDE 0871 Class B.

### VIBRATION & SHOCK

Per MIL-STD-810D Method 514.3, Cat. 1, Proc. I  
Method 516.3, Proc. III.

## R SERIES SPECIFICATIONS

### INPUT

105-125/210-250 VAC, 47-440 Hz. Derate output current 10% for nominal 50Hz. operation.

### OUTPUT

See table of models. Outputs are adjustable  $\pm 5\%$ .

### OPERATING TEMPERATURE

0°C to 50°C full rated, derate linearly to 40% at 71°C.

### STORAGE TEMPERATURE

-20°C to 85°C.

### INPUT ISOLATION

Per UL 478 input to output and case.

### OUTPUT ISOLATION

300 VDC to case.

### LINE REGULATION

$\pm 0.05\%$  for a 10% line change.

### LOAD REGULATION

$\pm 0.05\%$  for a 50% load change.

### RIPPLE & NOISE

1 mV rms, 5 mV pk.-pk.

### TEMPERATURE COEFFICIENT

0.03% per °C.

### STABILITY

$\pm 0.1\%$  typical for 8 hours after warm up.

### RECOVERY TIME

30 microseconds typical for a 10% line change or a 50% load change.

### REMOTE PROGRAMMING

1000 ohms per volt.

### REMOTE SENSING

Built-in capability with loss of sense protection.

### OVERLOAD & SHORT CIRCUIT PROTECTION

Adjustable auto-recovery foldback current limiting.

### REVERSE VOLTAGE PROTECTION

Provided on output and pass element.

### OVERVOLTAGE PROTECTION

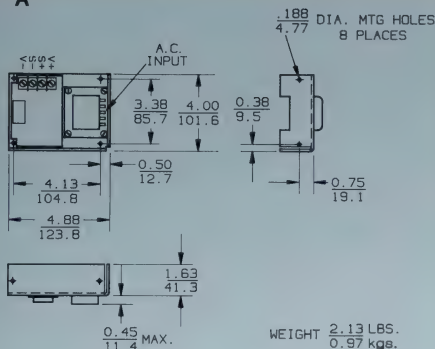
Accessory adjustable crowbar OVP. Refer to CB Series crowbars.

### INTERFACE

Input solder lugs, output barrier block terminals.

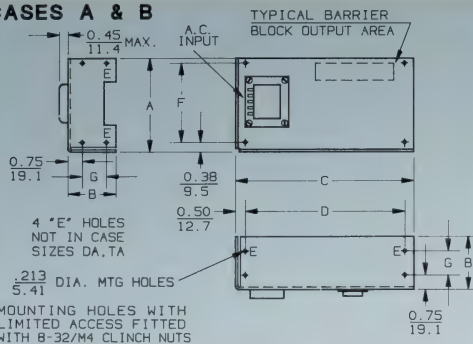
## World Series Singles

### CASE A



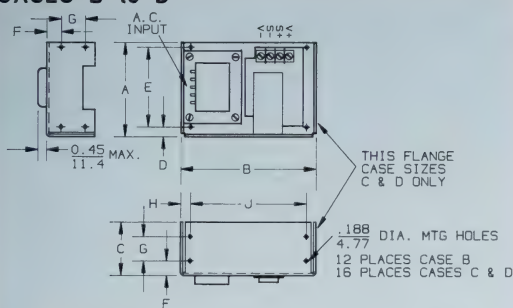
## World Series Multiples

### CASES A & B



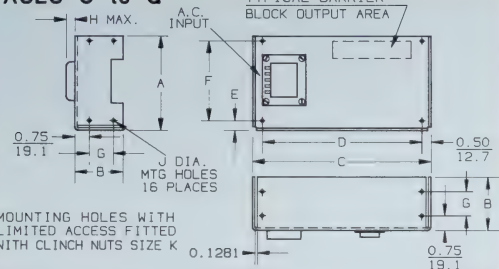
CASE SIZE	A	B	C	D	F	G	APPROX. WEIGHT
DA, TA	4.00	1.63	6.50	5.75	3.38	O	2.00
	101.6	41.3	165.1	146.1	85.7		0.91
DB, TB	4.88	2.50	7.00	6.25	4.13	1.25	4.00
	123.8	63.5	177.8	158.8	104.8	31.8	1.81

### CASES B to D



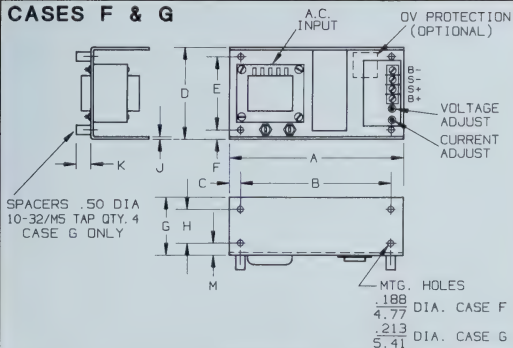
CASE SIZE	A	B	C	D	E	F	G	H	J	APPROX. WEIGHT
B	4.88	5.63	2.50	5.0	4.13	7.5	1.25	5.0	4.88	4.06
	123.8	142.9	63.5	127.0	104.8	191.1	31.8	12.7	123.8	1.84
C	4.88	7.00	2.75	5.0	4.13	7.5	1.25	3.8	6.25	6.13
	123.8	177.8	69.9	127.0	104.8	191.1	31.8	9.5	158.8	2.78
D	4.88	9.00	2.75	5.0	4.13	7.5	1.25	5.0	8.00	7.88
	123.8	228.6	69.9	127.0	104.8	191.1	31.8	12.7	203.2	3.57

### CASES C to G



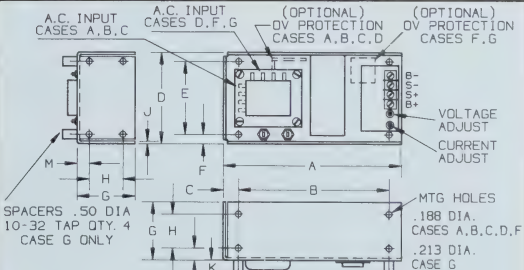
CASE SIZE	A	B	C	D	E	F	G	H	J	K	APPROX. WEIGHT
DC, TC	4.88	2.75	3.8	8.38	5.0	4.13	1.25	.45	.213	8-32	7.50
	123.8	69.9	96.5	212.7	127.0	104.8	31.8	11.4	5.41	M4	3.40
TD	4.00	2.50	10.25	9.25	3.8	3.38	1.25	.45	.213	8-32	5.00
	101.6	63.5	260.4	235.0	9.5	85.7	31.8	11.4	5.41	M4	2.27
TE	4.88	2.75	11.00	7.00	5.0	4.13	1.25	.45	.213	8-32	9.00
	123.8	69.9	279.4	177.8	127.0	104.8	31.8	11.4	5.41	M4	4.08
TF	4.88	2.75	14.25	8.75	5.0	4.13	1.25	.62	.250	10-32	11.00
	123.8	69.9	362.0	222.3	127.0	104.8	31.8	15.9	6.35	M5	4.99
TG	4.88	3.75	15.00	14.00	5.0	4.13	1.25	.65	.250	10-32	12.00
	123.8	95.3	381.0	355.6	127.0	104.8	63.5	16.5	6.35	M5	5.44

### CASES F & G



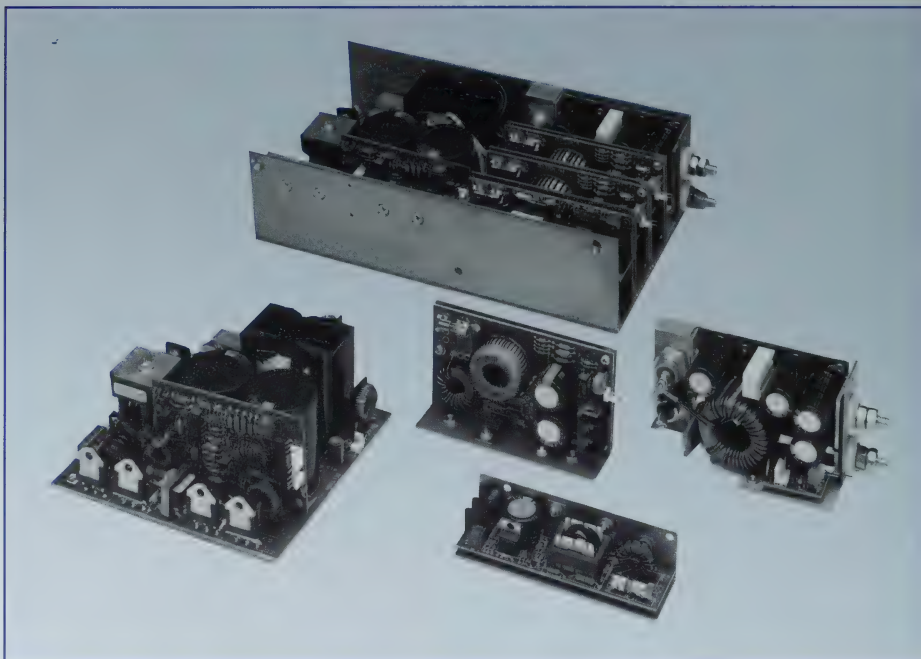
CASE SIZE	A	B	C	D	E	F	G	H	J	K	M	APPROX. WEIGHT
F	14.00	13.00	.50	4.88	4.13	.38	2.75	1.25	.13	.50	.75	14.00
	355.6	330.2	12.7	123.8	104.8	9.5	69.9	31.8	3.2	12.7	19.1	6.35
G	16.75	16.00	.38	4.88	4.13	.38	4.13	2.50	.13	.75	1.06	21.00
	425.3	406.4	9.5	123.8	104.8	9.5	104.8	63.5	3.2	19.1	26.9	9.53

## R Series Singles



CASE SIZE	A	B	C	D	E	F	G	H	J	K	M	APPROX. WEIGHT
A	4.88	4.13	.50	4.00	4.88	4.13	.38	2.50	1.25	.13	.47	.75
	123.8	104.8	12.7	101.6	123.8	104.8	9.5	63.5	31.8	3.2	11.9	19.1
B	5.63	4.88	.50	4.00	4.88	4.13	.38	2.75	1.25	.13	.47	.75
	142.9	123.8	12.7	101.6	123.8	104.8	9.5	70.0	31.8	3.2	11.9	19.1
C	7.00	6.25	.38	4.88	4.13	.38	2.75	1.25	.13	.47	.75	
	177.8	158.8	9.5	123.8	104.8	9.5	70.0	31.8	3.2	11.9	19.1	
D	9.00	8.00	.50	4.88	4.13	.38	2.75	1.25	.13	.47	.75	
	228.6	203.2	12.7	123.8	104.8	9.5	70.0	31.8	3.2	11.9	19.1	
E	14.00	13.00	.50	4.88	4.13	.38	2.75	1.25	.13	.47	.75	
	355.6	330.2	12.7	123.8	104.8	9.5	70.0	31.8	3.2	11.9	19.1	
F	16.75	16.00	.38	4.88	4.13	.38	4.13	2.50	.13	.75	1.06	
	425.3	406.4	9.5	123.8	104.8	9.5	104.8	63.5	3.2	19.1	26.9	

# CUSTOM MODUFLEX® SWITCHERS



## DESCRIPTION

Moduflex® switchers form a comprehensive line of open frame power supplies assembled from standard "off the shelf" modules. These subunits and assembly hardware are pre-approved by safety agencies so that certifications can easily be obtained for custom models. Additional advantages include fast delivery at moderate costs.

The M and DM Series offers the highest power density available in the industry, delivering 6 watts per cubic inch at an ambient temperature of 50°C. The design features "State of the Art" topology, a meticulous thermal structure and the use of high efficiency circuits and components to attain the desired power density.

The modular system concept reduces manufacturing to submodule assembly, capable of high volume production with a superior quality level.

M Series are available in power ratings from 200 to 750 watts. DM Series are available with a 48 VDC input and output power ratings of 400 and 600 watts. Other DC inputs, e.g. 24V, 28V, 110V, etc., are available on special order.

## FEATURES

- UL, CSA, TUV (IEC, VDE) design.
- 6 watts per cubic inch.
- 1-7 outputs. 200-750 watts.
- 120 kilohertz MOSFET design.
- All outputs:
  - Adjustable*
  - Fully regulated*
  - Floating*
  - Overload and short circuit proof*
  - Overvoltage protected*
- Standard features include:
  - System inhibit*
  - Load proportional DC fan output*
- Options include:
  - Auto Ranger*
  - Power fail monitor*
  - Quick connects*
  - Cover*
  - Fan cover*
  - Active surge limit*
- VME power fail module accessory.
- Fast delivery.
- Replaces expensive high density systems using potted modules.

## MODEL SELECTION

Input modules are available in ratings of 200 through 750 watts with corresponding code letters P, R and A through D. See Power Codes chart.

Output modules are available in four types J, K, L and M in nominal power outputs of 75, 150, 300 and 500 watts respectively. Type M modules are variable power rated depending upon the power level of the input module. This is reflected in the ratings table which shows the corresponding multiplier applicable to the output current ratings of the M module as a function of the power ratings of the input module. For example, a 750 watt multiple will have its M type module configured to produce 600 watts of output. The ratings of output modules are given in the table of output types. Ratings in shaded areas are stocked for fast delivery.

Input Module Power Codes	
P	250W
R	350W
A	400W
B	500W
C	600W
D	750W

M Type Main Module Ratings			
Code	Power Rating	Current Multiplier	
		Single	Multiple
A	250W	—	0.3
B	350W	—	0.4
C	400W	0.8	0.6
D	500W	1.0	0.8
E	600W	1.2	1.0
F	750W	1.5	1.2

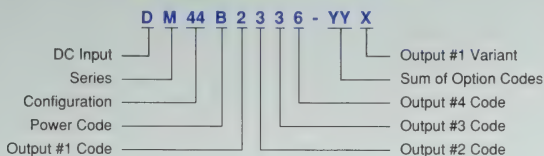
Output Modules*					
Code	Volts	Type			
		J Amps	K Amps	L Amps	M Amps
0	2	10	20	30	100
1	3.3	10	20	30	100
2	5	10	20	30	100
3	12	6	12	24	42
4	15	5	10	20	33
5	18	4	8	16	28
6	24	3	6	12	21
7	28	2.5	5	10	18
8	36	2	4	8	14
9	48	1.5	3	6	10
A	2.2	10	20	30	100
B	2.4	10	20	30	100
C	2.7	10	20	30	100
D	3	10	20	30	100
E	3.6	10	20	30	100
F	4	10	20	30	100
G	4.5	10	20	30	100
H	5.7	10	20	30	90
J	6.3	10	20	30	80
K	7	9	18	30	70
L	8	8	16	30	62
M	9	8	15	30	56
N	10	7	14	30	50
P	11	7	13	27	45
Q	13.5	6	11	22	37
R	17	5	9	18	30
S	19	4	8	16	26
T	21	4	7	14	24
U	23	4	7	13	22
V	26	3	6	12	19
W	29	3	5	10	17
X	32	2	5	9	16
Y	40	2	4	8	13
Z	44	2	4	7	12

Output Module Types	
J	1/2 Height
K	Full Height
L	Double Full
M	Main

## HOW TO ORDER

To form the proper model number defining a custom requirement, select the letter M or DM to designate the series, then choose the desired configuration of output modules and list the configuration code. Insert the power code letter for the power level and follow with the output code numbers or letters for each specific output. Enter a dash and from the option table insert the sum of the option codes. If a lower rating is desired for the M type main module, use the variant position and insert the power ratings code letter A, B, C, D, or E corresponding to the lower power module. If no preload is available for the main output, a K or L module can be substituted by inserting the corresponding letter in the variant position. See example below.

### MODUFLEX 500W QUAD SWITCHER



## OPTIONS

Option Code	Function
00	None
01	Power Fail Monitor
02	Auto Ronger
04	Quick Connects—all auxiliaries
08	Active Surge Limit
32	Cover
64	Fan Cover

Options 02 and 08 mutually exclusive.

### Output Configurations

Output #1 can be Type K, L, or M. For singles, M only.



For multiple output modules of a given type, voltages are arranged in ascending order by magnitude in the same sense as the output number sequence. \*Shaded ratings are stock.

The boxes above are diagrammatic representations of the power supplies as viewed from the output end. The two digit numbers above the boxes are the configuration codes. Configurations 40, 47, 49 and 58—Power Code D, Case 3. Configurations 26, 30 and 38—Power Codes C and D, Case 2. Remaining configurations—Power Codes A, B, C and D, Cases 1 and 2. Power Code P, Case 6—Configurations 32 and 42 only. Power Code R, Case 6—Configurations 34, 44 and 52 only. Case size 6 modules are in mirror image sequence from the diagrams shown.

## SPECIFICATIONS

### INPUT

90-132 VAC or 180-264 VAC, 47-440 Hz. Strappable.  
40-60 VDC for DM Series.

### INPUT SURGE

34 Amps peak from cold start for units under 400W, 68 Amps for other models.

### HOLDUP TIME

20 milliseconds from loss of nominal AC power.  
3 milliseconds for DM Series.

### OUTPUTS

See model selection table.

### ADJUSTABILITY

±5% trim adjustment.

### OUTPUT POLARITY

All outputs are floating from chassis and each other and can be referenced to each other or ground as required.

### LINE REGULATION

Less than ±0.1% or ±5mV for input changes from nominal to min. or max. rated values.

### LOAD REGULATION

±0.2% or ±10mV for load changes from 50% to 0% or 100% of max. rated values.

### MINIMUM LOAD

Main output requires a 10% minimum load for full output from auxiliaries.

### REMOTE SENSING

On all outputs except type J modules.

### RIPPLE & NOISE

1% or 100mV pk-pk, 20 MHz bandwidth.

### OPERATING TEMPERATURE

0-70°C. Derate 2.5%/°C above 50°C.

### COOLING

A min. of 6 LFS\* for models under 400W, 10 LFS for others, directed over the unit for full rating. Two test locations on chassis rated for max. temperature of 90°C. For convection rating on 250W units derate output currents by 30% and max. power by 20%.  
\*Linear feet/second.

### TEMPERATURE COEFFICIENT

±0.02%/°C.

### EFFICIENCY

80% typical.

### SAFETY

Units meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805.

### DIELECTRIC WITHSTAND

3000 VRMS input to ground.  
3000 VRMS input to output.  
700 VDC output to ground.

### SPACING

5 mm primary to secondary.  
2.5 mm to grounded circuits.

### LEAKAGE CURRENT

0.75 mA at 115 VAC 60Hz. input.  
Not applicable to DM Series.

### EMISSIONS

Units meet FCC 20780 Part 15 Class A and VDE 0871/6.78 Class A for conducted emissions. Compliance with Class B limits

by use of additional external filter. DM Series also meet Bellcore TR-TSY-000515.

### DYNAMIC RESPONSE

Peak transient less than ±2% or ±200mV for step load change from 75% to 50% or 100% of max. ratings.

### RECOVERY TIME

Recovery within 1%.  
M type main module – 200 microseconds.  
J, K, and L modules – 500 microseconds.

### INPUT UNDERVOLTAGE

Protects against damage for undervoltage operation.

### OVERVOLTAGE PROTECTION

Standard on all outputs.

### REVERSE VOLTAGE PROTECTION

All outputs are protected up to load ratings.

### OVERLOAD & SHORT CIRCUIT

Outputs protected by duty cycle current foldback circuit with automatic recovery. Auxiliaries have additional backup fuse protection.

### THERMAL SHUTDOWN

Circuit cuts off supply in case of local over temperature. Units reset automatically when temperature returns to normal.

### SOFT START

Units have soft start feature to protect critical components.

### FAN OUTPUT

Nominal 12VDC @ 12 watts maximum.  
Not provided on models less than 400W.

### INHIBIT

TTL compatible system inhibit provided.

### SHOCK

MIL-STD 810-D Method 516.3, Procedure III.

### VIBRATION

MIL-STD 810-D Method 514.3, Category 1, Procedure I.

### MECHANICAL

CASE	WATTS	H	x	W	x	L
1	400W/500W	2.50"	x	5.05"	x	9.00"
2	600W/750W	2.50"	x	5.20"	x	9.63"
3	600W/750W	2.50"	x	6.50"	x	9.63"
6	250W/350W	2.50"	x	4.00"	x	8.00"

### POWER FAIL MONITOR

Optional circuit provides isolated TTL and VME compatible ACFail signal providing 4 milliseconds warning before main output drops by 5% after an input failure.

### AUTO RANGER

Optional circuit provides automatic operation at specified input ranges without strapping. Not applicable to DM Series.

### QUICK CONNECTS

Dual .187 quick connect tab terminals.

### ACTIVE SURGE LIMIT

Limits input surge to less than 18 Amps, and provides rapid reset.

### COVER

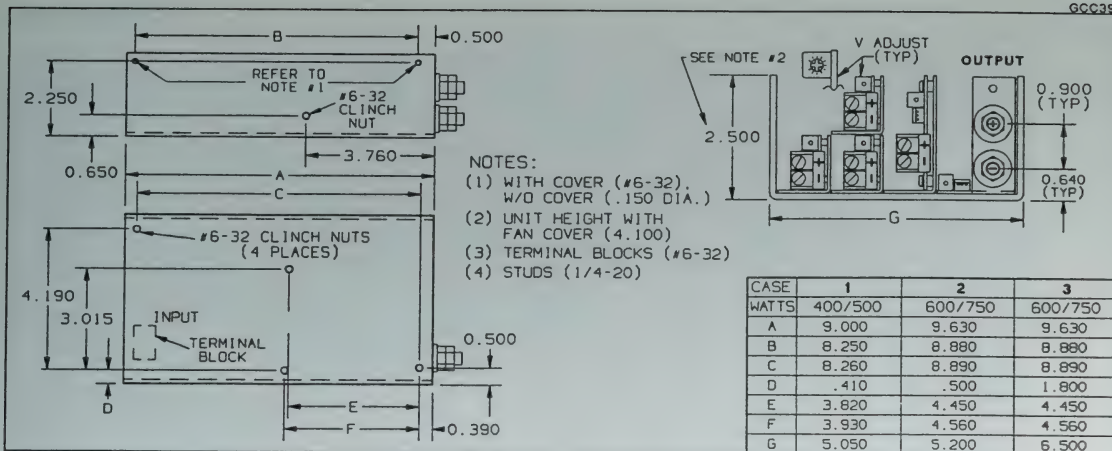
Optional flat cover recommended when customer supplied fan cooling is directed through the length of the unit.

### FAN COVER

Optional cover with brushless DC ball bearing fan which provides the required air flow for full rating of Moduflex power supplies.

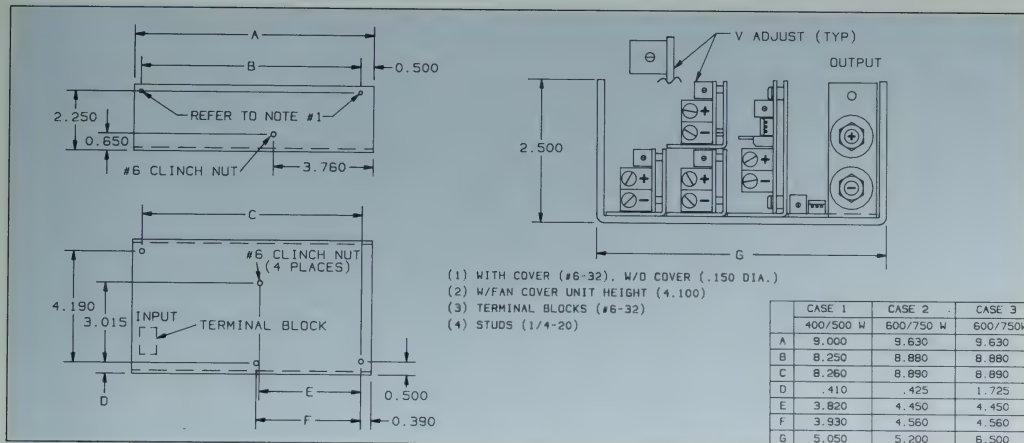
# DIMENSIONS

GCC393





## DIMENSIONS



See page 15 for Case Size 6 mechanical details.

## MODEL PF-VME Power Fail Module

### DESCRIPTION

Power fail module, Model PF-VME is a stand alone unit powered by the AC and DC input signals. If both AC and DC signals are above the user adjustable thresholds then an ACFAIL\* signal is asserted followed by the assertion of a SYSRESET\* signal in accordance with VME timing specifications. If either the AC or DC signal drops below its threshold then the output signals become disasserted in accordance with VME timing specifications. Outputs are TTL compatible with VME ratings. The autoranging feature will automatically change the AC input comparator threshold from the low voltage set point to the high voltage set point. This switchover occurs at approximately 140 VAC.



### POWER DOWN SEQUENCE

ACFAIL\* goes low when either the AC or DC input drops below its respective threshold. SYSRESET\* goes low  $3 \pm 0.5$  milliseconds later.

### OUTPUT HOLDUP TIME

Outputs remain active for 400 milliseconds min.

### THRESHOLD HYSTERESIS

AC - 3% max.

DC - 1% max.

### THRESHOLD TEMPERATURE COEFFICIENT

AC -  $\pm 0.03\%/^{\circ}\text{C}$ .

DC -  $\pm 0.02\%/^{\circ}\text{C}$ .

### OUTPUT REFERENCE

Signal outputs are referenced to the negative of the nominal 5 volt input.

### OPERATING TEMPERATURE

0 - 70°C.

### STORAGE TEMPERATURE

-20 - +85°C.

### SPECIFICATIONS

#### AC INPUT

85-264 VAC, 47-63 Hz.

#### DC INPUT

4-6 VDC.

#### AC THRESHOLD RANGE

85-110; 170-220 VAC.

Autoranging.

#### DC THRESHOLD RANGE

4-5 VDC.

#### ACFAIL\* OUTPUT

Open collector.

50 mA/30V.

#### SYSRESET\* OUTPUT

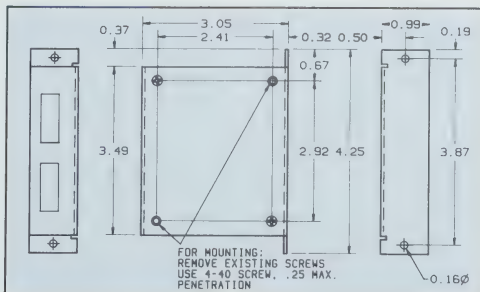
Open collector.

50 mA/30V.

### POWER UP SEQUENCE

ACFAIL\* goes high when both AC and DC inputs reach their respective thresholds. SYSRESET\* goes high  $300 \pm 50$  milliseconds later.

### DIMENSIONS



# CUSTOM PFC MODUFLEX® SWITCHERS

Sine Wave Current • Harmonics Meet IEC 555-2



**1000 Watts Output Without Exceeding UL Limits For Ordinary Duplex Outlets**

## DESCRIPTION

The FM Series is derived from our line of ultra compact Moduflex® switchers. New input modules incorporate power factor correction. The resultant input current wave form is nearly a perfect sine wave compliant to the harmonic requirements of IEC 555-2.

This series offers a power density of 4 watts per cubic inch at an ambient temperature of 50°C.

These subunits and assembly hardware are pre-approved by safety agencies so that certifications can easily be obtained for custom models.

Modular construction permits high volume manufacturing with an outstanding quality level and allows us to deliver your custom unit on time at a competitive cost.

## FEATURES

- 0.99 power factor.
- 4 watts per cubic inch.
- 1-7 outputs, 600-2000 watts.
- 120 kilohertz MOSFET design.
- Universal input.
- UL, CSA, TUV (IEC, VDE) design.
- Models for VME, VXI, FUTUREbus, etc.
- All outputs:
  - Adjustable
  - Fully regulated
  - Floating
  - Overload and short circuit proof
  - Overvoltage protected
- Standard features include:
  - System inhibit
  - Fan output
- Options include:
  - Power fail monitor
  - Quick connects
  - End or top fan covers
- VME power fail module accessory.

## MODEL SELECTION

Input modules are available in ratings of 600, 1000, and 2000 watts with corresponding code letters of C, E and G. Refer to Power Code Table.

Output modules are available in ten types ranging in nominal power from 75 to 2000 watts. Refer to Output Code Table for codes and nominal power output.

Input Power Codes		Output Codes	
Codes	Watts	Codes	Nominal Power
C	600	J	75
E	1000	K	150
G	2000	G	300
		L	300
		M3	400
		M4	500
		M5	600
		M6	750
		M7	1000
		M9	2000

The Table of Ratings for the various types of output modules lists the maximum current for each type as a function of corresponding voltage rating.

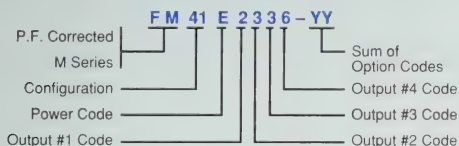
Ratings in the shaded area are Preferred and are stocked for fast delivery.

Note: When computing output load power, multiply the fraction of actual current to max. rated current by the nominal power rating of the output module.

## HOW TO ORDER

Select the letters FM for power factor corrected M Series. Choose the desired configuration of output modules and list the configuration code. Insert the power code letter and follow with the output code numbers for each individual output. Enter a dash and from the option table insert the sum of the option codes.

See example below.



## OPTIONS

Option Code	Function
0	None
1	Power Fail Monitor
2	Quick Connects—all auxiliaries
4	End Fan Cover (600W only)
8	Top Fan Cover (600W only)

## VME POWER FAIL MODULE—MODEL PF-VME

See page 29 for description.



## RATINGS OF OUTPUT MODULES

Nominal Power		75W	150W	300W	300W	400W	500W	600W	750W	1000W	2000W
Code	Volts	J	K	G	L	M3	M4	M5	M6	M7	M9
0	2	10	20	20	30	80	100	120	150	200	400
1	3.3	10	20	20	30	80	100	120	150	200	400
2	5	10	20	20	30	80	100	120	150	200	400
3	12	6	12	20	24	34	42	50	62	84	168
4	15	5	10	20	20	26	33	40	50	67	134
5	18	4	8	16	16	22	28	33	42	56	112
6	24	3	6	12	12	17	21	25	31	42	84
7	28	2.5	5	10	10	14	18	21	27	36	72
8	36	2	4	8	8	11	14	17	21	28	56
9	48	1.5	3	6	6	8	10	12	16	21	42

## OUTPUT LOCATIONS

### 600 Watt FM Configurations

12	#1 M5			
----	-------	--	--	--

24	#1 M4	#2 K		
----	-------	------	--	--

26	#1 M4	#2 L		
----	-------	------	--	--

30	#1 M3	#2 L	#3 K	
----	-------	------	------	--

36	#1 M3	#2 K	#3 K	
----	-------	------	------	--

48	#1 M3	#2 K	#3 K	#4 K
----	-------	------	------	------

56	#1 M3	#2 K	#3 K	#5 J
				#4 J

64	#1 M3	#2 K	#6 J	#5 J
			#3 J	#4 J

72	#1 M3	#7 J	#6 J	#5 J
		#2 J	#3 J	#4 J

### 1000 Watt FM Configurations

11	AC			
	#1 M7			

21	AC			
		#2 L	#1 M6	

31	AC			
		#3 L	#2 L	#1 M6

41	AC			
	#4 G	#3 G	#2 G	#1 M6

43	AC			
	#4 K	#3 G	#2 G	#1 M6

51	AC			
	#5 J	#3 G	#2 G	#1 M6
	#4 J			

61	AC			
	#5 J	#6 J	#2 G	#1 M6
	#4 J	#3 J		

71	AC			
	#5 J	#6 J	#7 J	#1 M6
	#4 J	#3 J	#2 J	

### 2000 Watt FM Configurations

13	AC			
	#1 M9			

23	AC			
		#2 M7	#1 M7	

33	AC			
		#3 L	#2 M6	#1 M7

45	AC			
		#4 L	#3 L	#2 M6
				#1 M7

53	AC			
	#5 G	#4 G	#3 G	#2 M6
				#1 M7

55	AC			
	#5 K	#4 G	#3 G	#2 M6
				#1 M7

63	AC			
	#6 J	#4 G	#3 G	#2 M6
	#5 J			#1 M7

73	AC			
	#6 J	#7 J	#3 G	#2 M6
	#5 J	#4 J		#1 M7

## SPECIFICATIONS

**INPUT**

90-264 VAC, 47-63 Hz.  
190-264 VAC for 2000W units.

**POWER FACTOR**

0.99 at full load.

**HARMONIC CURRENTS**

Compliant to IEC 555-2.

**INPUT SURGE**

230 VAC - 75A max.  
115 VAC - 40A max.

**HOLDUP TIME**

20 milliseconds from loss of AC power.

**OUTPUTS**

See model selection table.

**ADJUSTABILITY**

±5% trim adjustment.

**OUTPUT POLARITY**

All outputs are floating from chassis and each other and can be referenced to each other or ground as required.

**LINE REGULATION**

Less than ±0.1% or ±5mV for input changes from nominal to min. or max. rated values.

**LOAD REGULATION**

±0.2% or ±10mV for load changes from 50% to 0% or 100% of max. rated values.

**MINIMUM LOAD**

Main output requires a 10% minimum load for full output from auxiliaries. Main output is #1 on 600W and 1000W units and #2 on 2000W units.

**REMOTE SENSING**

On all outputs except type J modules.

**RIPPLE & NOISE**

1% or 100mV pk-pk, 20 MHz bandwidth.

**OPERATING TEMPERATURE**

0-70°C. — Derate 2.5%/°C above 50°C.

**COOLING**

A min. of 10 LFS cooling air directed on cooling surfaces over the 600W units for full rating. Two test locations on chassis rated for max. temperature of 90°C. 1000W and 2000W models have built-in ball bearing fan.

**TEMPERATURE COEFFICIENT**

±0.02%/°C.

**EFFICIENCY**

70% to 80%.

**SAFETY**

Units meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805.

**DIELECTRIC WITHSTAND**

3000 VRMS input to ground.  
3000 VRMS input to output.  
700 VDC output to ground.

**SPACING**

5 mm primary to secondary.  
2.5 mm primary to grounded circuits.

**LEAKAGE CURRENT**

3.5 mA max.

**EMISSIONS**

Units meet FCC 20780 Part 15 Class A and VDE 0871 Class A for conducted emissions. Compliance with Class B limits by use of additional external filter.

**DYNAMIC RESPONSE**

Peak transient less than ±2% or ±200mV for step load change from 75% to 50% or 100% max. ratings.

**RECOVERY TIME**

Recovery within 1%.  
M3, M4, M5, M6, M7 and M9 modules—  
200 microseconds.  
J, K, G, and L modules—500 microseconds.

**INPUT UNDERVOLTAGE**

Protects against damage for undervoltage operation.

**OVERVOLTAGE PROTECTION**

Standard on all outputs.

**REVERSE VOLTAGE PROTECTION**

All outputs are protected up to load ratings.

**OVERLOAD & SHORT CIRCUIT**

Outputs protected by duty cycle current foldback circuit with automatic recovery. Auxiliaries have additional backup fuse protection.

**THERMAL SHUTDOWN**

Circuit cuts off supply in case of local over temperature. Units reset automatically when temperature returns to normal.

**SOFT START**

Units have soft start feature to protect critical components.

**FAN OUTPUT**

Nominal 12 VDC @ 12 watts maximum.

**INHIBIT**

TTL compatible system inhibit provided.

**SHOCK**

MIL-STD 810-D Method 516.3, Procedure III.

**VIBRATION**

MIL-STD 810-D Method 514.3, Category 1, Procedure I.

**MECHANICAL**

600W — Case 1. — 2.5 x 5.05 x 12  
1000W — Case 2. — 5.05 x 5.05 x 12  
2000W — Case 3. — 5.05 x 8 x 12

**POWER FAIL MONITOR**

Optional circuit provides isolated TTL and VME compatible ACFAIL signal providing 4 milliseconds warning before main output drops by 5% after an input failure.

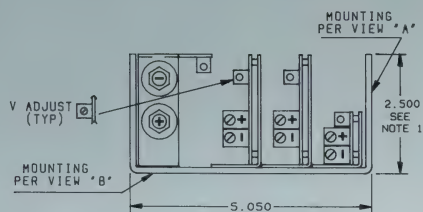
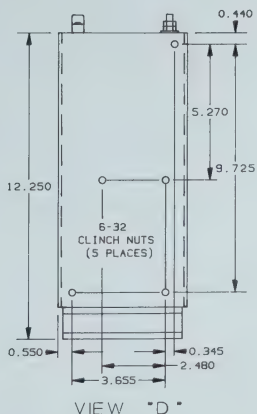
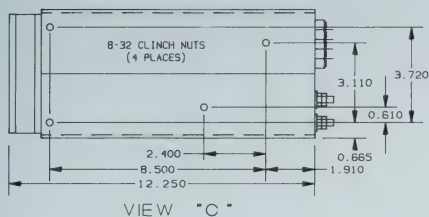
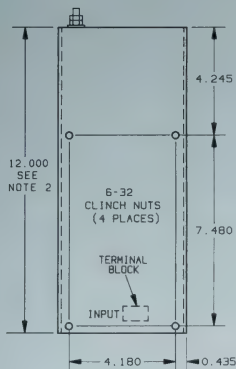
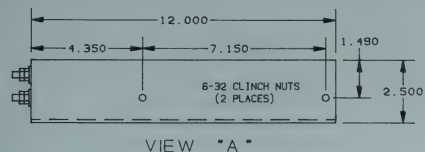
**QUICK CONNECTS**

Dual .187 quick connect tab terminals.

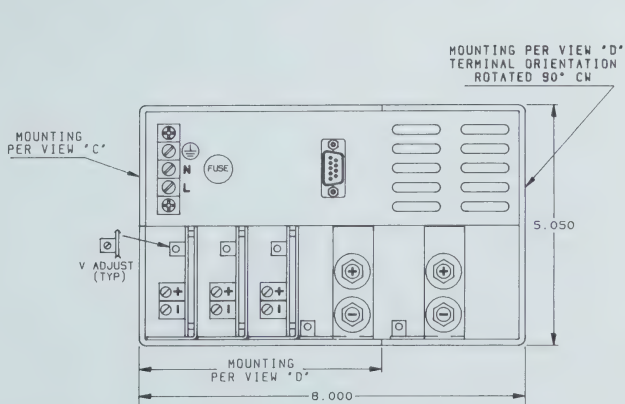
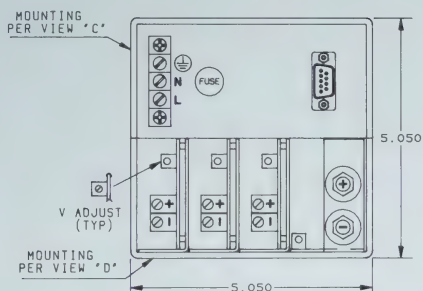
**FAN COVER**

Optional covers with brushless DC ball bearing fan which provides the required air flow for full rating of 600W units. Choice of low profile or top mounted types.

## DIMENSIONS



- NOTES:
1. WITH TOP FAN COVER  
UNIT HEIGHT (4.100)
  2. WITH END FAN COVER  
UNIT LENGTH (13.300)
  3. TERMINAL BLOCKS (6-32).
  4. STUDS (1/4-20).



# HIGH POWER CASED SWITCHERS

1-5 Outputs, 500-1800 Watts

Nom. 115/230 VAC Input—VF Series

Nom. 48 VDC Input — DVF Series



## DESCRIPTION

The VF Series form a comprehensive line of enclosed power supplies featuring all isolated and regulated outputs. Typical efficiencies of 80 percent are achieved through the use of high frequency switching regulators.

Models are available in configurations of 1 to 5 outputs with voltage ratings of 2 to 48V in a wide variety of output power levels.

This series is derived from Deltron's V Series single output power supplies and specially designed, high efficiency Mag Amp regulators. The resultant final assembly is a rugged, careful thermally managed enclosure that will provide years of outstanding performance.

## FEATURES

- UL, CSA, TUV (IEC, VDE) design.
- VDE, FCC, Bellcore emissions.
- All outputs:
  - Adjustable*
  - Fully regulated*
  - Floating*
  - Foldback current limited*
- Quad mode soft start.
- Dual line spike suppressors.
- Options include:
  - Power fail monitor*
  - Thermal shutdown*
  - Remote inhibit*
  - Margining*
- Economic Modular Construction.

## MODELS & RATINGS

Outputs are available in the voltages shown in the table at max. currents consistent with the output power levels listed. (150 and 300 watt outputs only available with 12 Volt rating, Code 2.) \*Non-standard voltages available on custom order.

Replace X's with desired output codes.

Code	Voltage
1	5V
2	12V
*3	15V
*4	18V
5	24V
*6	48V
*7	2V
*8	3.3V
*9	28V

### SINGLES

	Model	Output 1	Case Size
D	VF1AX-YYY	500W	A
	VF1BX-YYY	750W	A
D	VF1CX-YYY	1000W	A
D	VF1HX-YYY	1500W	B
	VF1LX-YYY	1800W	B

### DUALS

	Model	Output 1	Output 2	Max. Power	Case Size
D	VF2AX-YYY	300W	200W	500W	A
	VF2BX-YYY	500W	250W	750W	A
D	VF2CX-YYY	500W	500W	1000W	A
	VF2DX-YYY	750W	250W	1000W	B
	VF2EX-YYY	750W	500W	1250W	B
D	VF2HX-YYY	1000W	500W	1500W	B

### TRIPLES

	Model	Output 1	Output 2	Output 3	Max. Power	Case Size
	VF3AXX-YYY	250W	150W	100W	500W	A
	VF3BX-YYY	500W	150W	100W	750W	A
	VF3LXX-YYY	600W	150W	100W	850W	A
D	VF3CXX-YYY	500W	300W	200W	1000W	A
	VF3DXX-YYY	750W	150W	100W	1000W	B
	VF3MXX-YYY	600W	300W	200W	1100W	A
	VF3EXX-YYY	500W	500W	250W	1250W	B
	VF3FXX-YYY	750W	300W	200W	1250W	B
D	VF3HXX-YYY	500W	500W	500W	1500W	B
D	VF3IXX-YYY	1000W	300W	200W	1500W	B
	VF3NXX-YYY	600W	500W	500W	1600W	B

### QUADS

	Model	Output 1	Output 2	Output 3	Output 4	Max. Power	Case Size
	VF4AXXX-YYY	150W	100W	150W	100W	500W	A
	VF4BXXX-YYY	300W	200W	150W	100W	750W	A
D	VF4CXXX-YYY	300W	200W	300W	200W	1000W	A
	VF4DXXX-YYY	500W	250W	150W	100W	1000W	B
	VF4EXXX-YYY	500W	500W	150W	100W	1250W	B
	VF4FXXX-YYY	500W	250W	300W	200W	1250W	B
	VF4LXXX-YYY	600W	500W	150W	100W	1350W	B
	VF4MXXX-YYY	600W	250W	300W	200W	1350W	B
D	VF4HXXX-YYY	500W	500W	300W	200W	1500W	B
	VF4NXXX-YYY	600W	500W	300W	200W	1600W	B

### PENTS

	Model	Output 1	Output 2	Output 3	Output 4	Output 5	Max. Power	Case Size
	VF5BXXXX-YYY	250W	150W	100W	150W	100W	750W	B
	VF5CXXXX-YYY	500W	150W	100W	150W	100W	1000W	B
	VF5EXXXX-YYY	500W	300W	200W	150W	100W	1250W	B
D	VF5HXXXX-YYY	500W	300W	200W	300W	200W	1500W	B

## OPTION CODES—

Replace YYY with sum of option codes desired.

Code	Function
000	None
001	OVP on Output 2
002	OVP on Output 3
004	OVP on Output 4
008	OVP on Output 5
016	FCC/VDE EMI Filter
032	Line Monitor
064	Logic Inhibit
128	Thermal Shutdown

### Model Selection

DC Input Units — ☒ VF 3 H X X X — Y Y Y

Series —

No. of Outputs —

Power Code —

Sum of Option Codes

Output #3 Code

Output #2 Code

Output #1 Code

### Example: VF3H125-163

A VF Series triple with 1500W max. total output power. Output #1 is 5V 500W, output #2 is 12V 500W and output #3 is 24V 500W. Decomposing the 163 option code into the sum of powers of two yields 128 + 32 + 2 + 1 which denotes an OVP on outputs #2 and #3, a line monitor, and thermal shutdown. Power levels of each output are designated in the table of models.

## SPECIFICATIONS

### OUTPUTS

See table of models.  
Outputs trim adjustable  $\pm 5\%$ .

### INPUT

90-132 VAC or 180-264 VAC, 47-63 Hz.  
Strappable. See factory for 400 Hz operation.  
40-60 VDC for DVF Series.

### INPUT SURGE

Less than 2 times the steady state peak current from cold start.

### LINE REGULATION

0.4% for input change from min. to max. rated values.

### LOAD REGULATION

0.4% for load change from min. to max. rated values.

### RIPPLE & NOISE

1% or 100 mV, pk.-pk., 20 MHz. bandwidth.

### REMOTE SENSING

On all outputs.

### HOLDUP TIME

20 milliseconds from loss of nominal AC power.  
3 milliseconds for DVF Series.

### EFFICIENCY

80% typ. (VF Series). 75% typ. (DVF Series).

### OVERVOLTAGE PROTECTION

Standard on output 1. Optional on other outputs.

### OPERATING TEMPERATURE

0-70°C. Derate 2%/°C above 50°C.

### TEMPERATURE COEFFICIENT

$\pm 0.02\%/^{\circ}\text{C}$ .

### OVERLOAD

Outputs protected by foldback current limiting with automatic recovery.  
Current limiting for DVF Series.

### REVERSE VOLTAGE PROTECTION

All outputs are protected up to load ratings.

### OUTPUT POLARITY

All outputs are floating from chassis and each other and can be referenced to each other or ground as required.

### MINIMUM LOAD

All 150W and 300W outputs require a 10% minimum load for optimum system performance.

### SAFETY

Internal modules meet UL 1950, CSA 22.2 No. 234, EN 60 950, IEC 950, VDE 0805.

### LEAKAGE CURRENT

3.5 mA.  
Not applicable to DVF Series.

### SPACING

8 mm primary to secondary.  
4 mm primary to grounded circuits.

### DIELECTRIC WITHSTAND

3750 VRMS input to ground.  
3750 VRMS input to output.  
700 VDC output to ground.

### EMISSIONS

Units meet FCC 20780 Part 15 Class A and VDE 0871/6.78 Class A for conducted emissions with optional filter. Compliance with Class B limits by use of an external additional filter. DVF Series units also meet Belcore TR-TSY-000515.

### AC UNDERVOLTAGE

Proprietary proportional drive and bias boot strap protect against damage for undervoltage operation.  
Not applicable to DVF Series.

### SOFT START

Units have soft start feature to protect critical components.

### DYNAMIC RESPONSE

Peak transient less than  $\pm 2\%$  or  $\pm 200$  mV for step load change from 75% to 50% or 100% max. ratings.

### RECOVERY TIME

Less than 400 microseconds to recovery within 1%.

### INHIBIT

Optional TTL logic inhibit input.

### THERMAL SHUTDOWN

Optional circuit cuts off supply in case of local over temperature. Unit resets automatically if excess temperature abates.

### LINE MONITOR

Optional circuit provides isolated TTL compatible output if line voltage drops below rated minimum.

### MARGINING

Fixed internal resistors can be installed to provide output margining up to  $\pm 10\%$ . Contact factory for this option.

### SHOCK

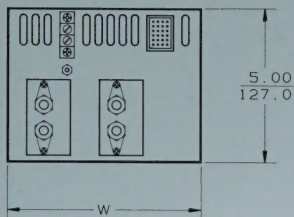
MIL-STD 810-D Method 516.3, Procedure III.

### VIBRATION

MIL-STD 810-D Method 514.3, Category 1, Procedure I.

### MECHANICAL

Case Size	Height (in/mm)	Width (in/mm)	Depth (in/mm)
A	5/127.	6/152.	13/330.
B	5/127.	8/203.	13/330.

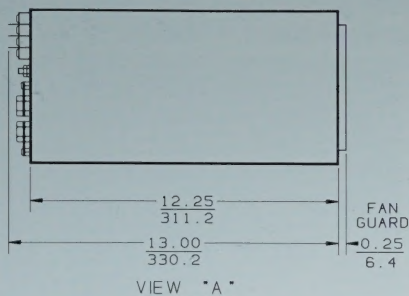


CASE SIZE	A	B
DIM.	6.00	8.00
W	152.4	203.2

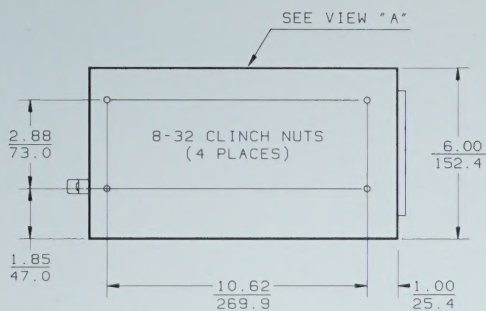
**NOTE:**

THE LOCATIONS FOR INPUT AND OUTPUT TERMINATIONS VARY BY MODEL.

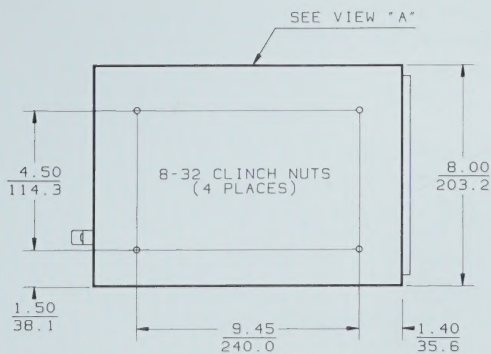
WHEN INPUT TERMINAL BLOCK COVER IS USED FRONT PROJECTION IS INCREASED BY  $\frac{0.25}{6.4}$



VIEW "A"



**CASE A**



**CASE B**

### Products & Services

Deltron manufactures a wide variety of power conversion products. In addition, we also provide contract manufacturing services ranging from "build to print" to complete design and assembly for transformers, inductors and other electro-mechanical items. Our dedicated, enthusiastic staff stands ready to support your needs by providing the best product solutions.

### To Order

Orders can be placed by calling us direct or contacting one of our many local distributors. We also have sales offices throughout the United States, Canada and Europe.

### TOLL FREE ORDER HOT LINE

800-523-2332

### Main Office:

Deltron Inc.  
290 Wissahickon Avenue  
P.O. Box 1369  
North Wales, PA 19454  
Phone: 215-699-9261  
Fax: 215-699-2310

### Prices

F.O.B. North Wales, PA or McAllen, TX.  
Quoted prices are valid for 30 days and subject to Deltron Standard Terms and Conditions.

### Minimum Order

No minimum order. A small handling charge applies for orders under \$500.00.

### Terms

Net 30 days to qualified customers.

Pricing and specifications subject to change without notice.

### Shipment

Best surface shipping methods will be used unless otherwise specified.

### Discounts

Liberal quantity discounts and OEM agreements are available for product shipped over a period of 1 year or less. Contact factory for more information.

### Source Inspection

5% or \$250.00 whichever is greater per shipment for witnessed electrical retest.

### Warranty

(a) Seller warrants each product here-in sold to be free from defects of material and workmanship. Sellers' liability under this warranty is limited to servicing, adjusting and replacement of defective parts for any product returned to Seller's factory within two (2) years for standard or one (1) year for non-standard products, shipping charges prepaid by Buyer. This warranty, shall not apply to any product which shall have been subjected to abnormal operating conditions or abuse, or which shall have been operated other than in accordance with Sellers' operating instructions. SELLER MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED.

(b) Seller shall not be liable for consequential or incidental damages.

### Repairs

All products returned for repair require a Return Material Authorization (RMA) number prior to return shipment. Contact Customer Service Department for details and authorization.

### Technical Support

Call 800-523-2332 for application engineer to answer technical questions.

## MANUFACTURING

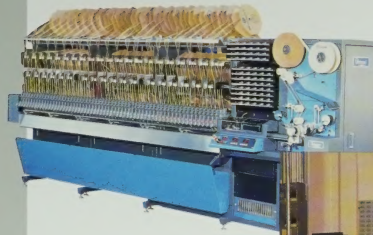
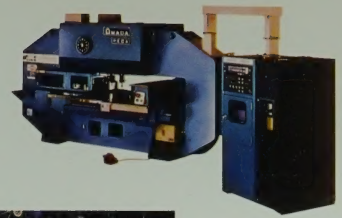
Deltron has a complete Sheet Metal Department with computer controlled punching, bending and processing equipment.

The Transformer Department is equipped with an array of multiple winders, toroidal winders, flat winders and special purpose heavy wire pullers. Additionally, automatic laminators, high-speed strippers, strip feed terminal presses, eyelet and riveting equipment provide the tools for manufacturing highly professional products. Impregnating equipment and large walk-in ovens are available providing total vertical integration.

Facilities are provided for thru-hole component insertion via automatic computer controlled machinery and specialized assembly lines to implement rapid hand assembly.

Processes such as wave solder and winding equipment operation, are under ASQC 90-94 control for consistent high quality production.

Each facility is equipped with computerized test equipment capable of performing virtually every type of electrical measurement required for analog circuits. As mentioned previously, calibration is in accordance with ASQC 90-94. Additional facilities include high temperature burn-in rooms, environmental chambers and machine shop facilities for custom fixtures and tooling.



## CUSTOMER SATISFACTION

Deltron, incorporated in 1952, has provided its many customers with a host of different product types ranging from miniature low power switching power supplies to large high voltage X-ray equipment and control systems.

Our number one priority is customer satisfaction and the management philosophy is carried throughout the entire organization.

Innovative, sound designs, statistical process control, documented workmanship standards, automated test, on-time delivery and superior customer service has produced many satisfied customers.

When getting the job done right means more than just getting the job done, call on us. We welcome the opportunity of serving you.

### POWER PRODUCTS GROUP

#### Switchers

- 120-2000 watts
- 1-7 outputs
- Up to 10W/in.<sup>3</sup>
- UL, CSA, VDE
- All regulated, isolated models
- Competitive prices
- Fast delivery

#### Linears

- Industry standard sizes
- 1-3 outputs
- All isolated outputs
- Stock delivery

### CONTRACT MANUFACTURING

- High frequency transformers
- High frequency inductors
- Toroidal components
- Printed circuit assemblies
- Cable harnesses
- Electro-mechanical assemblies
- Custom product designs



**Quality. Only Our Best Will Do**

Product ★ Service ★ Attitude



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Delinc • Padre Mier y Dr. Mina, Reynosa, Tamps., Mexico 08866. Tel: (892) 38723 Prefix - from USA - (01152) FAX: (892) 38776